MARCH 31, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Re-equipment Market

That's where machinery makers can boost sales, says Machine Tool Builder A. V. Bodine
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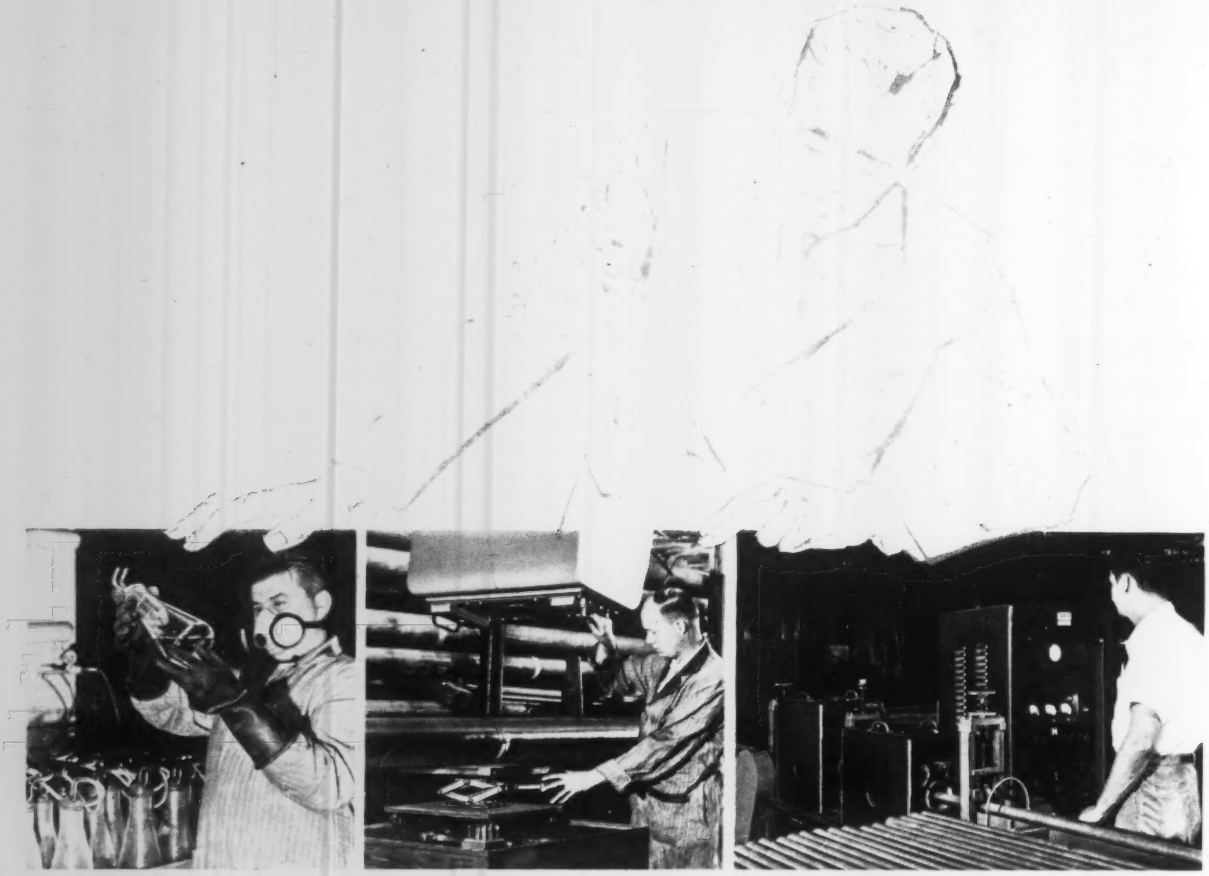


B&W Quality-Controlled Tubing

is matched to the application

From raw materials to finished tube, quality depends upon control and "know-how." And when it comes to matching the one right tube, of the hundreds of possibilities, for a particular end use application, it takes specialized equipment and experienced technicians.

For instance: If corrosion is a problem — will a steel with a particular heat treatment do the job? If the tube is unusually long and center welding is employed to achieve length — is the joint completely satisfactory? If the tube must have a special soundness quality — is it free from hidden or invisible defects?

These are but a few of the quality control checks which insure that the tubes you buy from B&W are as near perfect in terms of performance as it is possible to make them. When you need stainless, carbon or high alloy tubing — for pressure or mechanical applications — you can rely on Mr. Tubes and B&W to supply the best. Write for bulletin TB-420 — The B&W Quality Control Story. The Babcock & Wilcox Co., Tubular Products Division, Beaver Falls, Pa.

TA-8030-C3

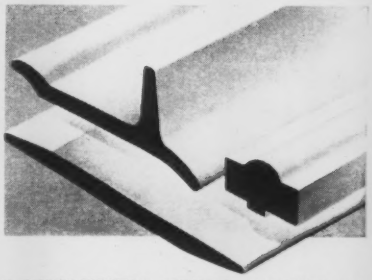
Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals.

A handful of reasons for using special bar sections

Chips. Just chips. But how eloquently they state the case for special bar sections!

Why cut or grind away excess steel that you've already paid for? Let us roll the steel to your drawings and specifications. You'll keep scrap to a minimum, eliminate excess operations. And chances are you'll have a better, stronger product to boot.

Hot-rolled special sections rolled by Bethlehem are used in typewriters, pipe wrenches and freight cars; in electric motors, automobile differentials and open-grid grating; for sled runners, door hinges and garden tines; for track shoes, scraper blades and lawn-mower blades. The possibilities are virtually endless. Couldn't *you* use special sections to advantage? We'd be glad to discuss the matter with you. Please call or write our sales office nearest you.

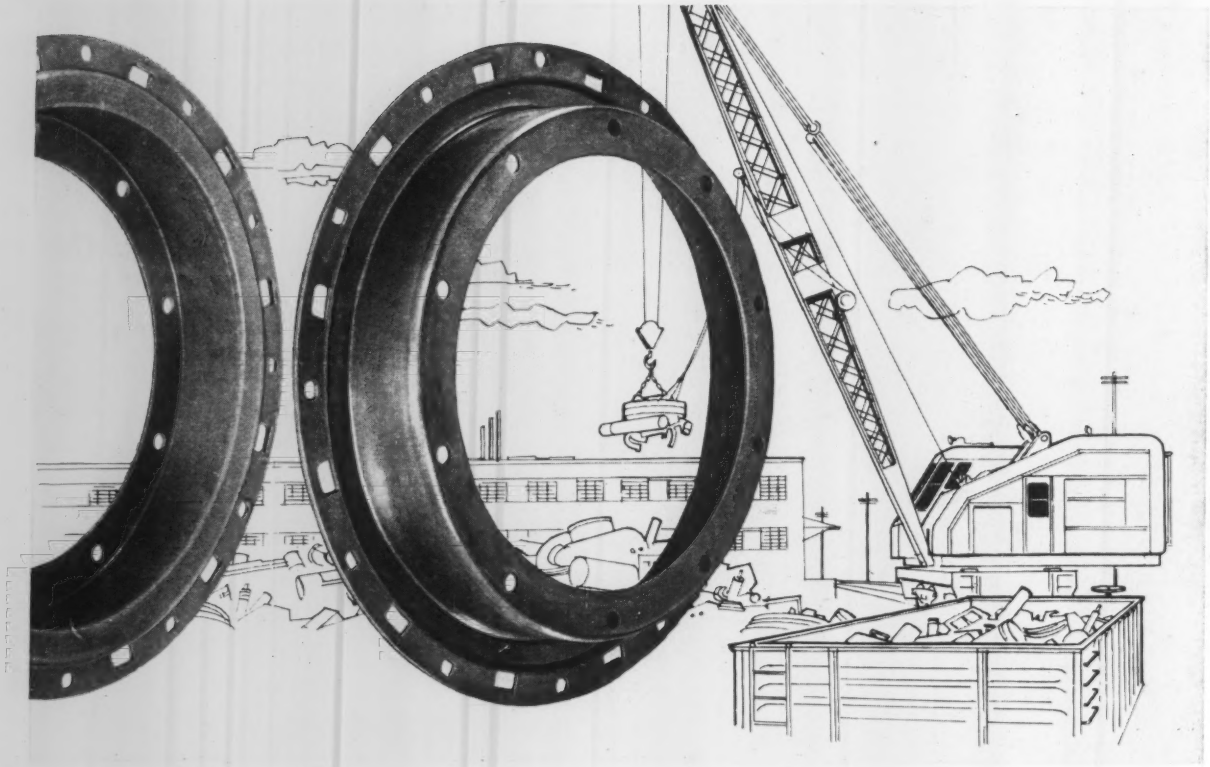


BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Stampings simplify clutch design

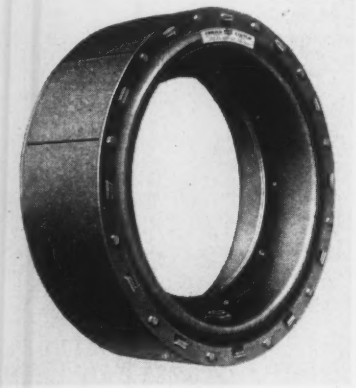
Housings custom stamped to close tolerances by COMMERCIAL eliminate costly machining.

Perfect shape and alignment maintained to assure safe, accurate, dependable control.

Pioneer in the development of air-actuated, functional clutches and brakes for use in many types of industrial and construction machinery, the Airflex Division of The Fawick Corporation uses COMMERCIAL custom stampings for the housings in its Type E air-ring clutches and brakes.

COMMERCIAL helped to design the required strength and close tolerances into these stampings, built the dies to produce them, and has been turning them out for The Fawick Corporation —without change in the original design— since 1944. Stampings are produced in ten different sizes, from 12 to 40 inches in diameter, to meet the varying load requirements of Fawick Airflex Type E clutch applications.

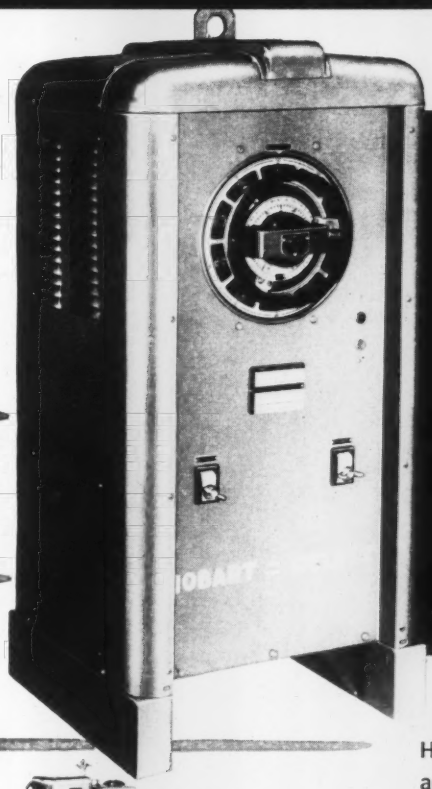
Typical close tolerances throughout each housing of +.005" – 000", +.005" –.005" and +.000" –.010", eliminate the need for costly machining of the stampings before final assembly



Gang-pierced in the stamped housings for the Fawick Airflex Type E clutch assembly, all holes are equally spaced ±.005" and all slots are equally spaced ±.010"

Designed into the stampings as well, is the *inherent strength* required to keep the shape, alignment and overall tolerances of the housings unchanged throughout their life in the field under the most severe operating conditions— constant wear, friction and resultant destructive heat. This unvarying strength in the stampings is an important factor in the dependable and trouble-free performance of Fawick Airflex Type E clutches.

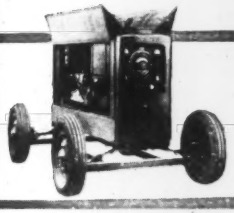
If you have a design problem involving component parts, we may be able to suggest a practical and economical solution based on our 30 years of experience in forming metals. Send details of your problem to Commercial Shearing & Stamping Company, Dept. L-14, Youngstown 1, Ohio.



AC Transformer 180 to 500 amperes

DC Rectifier Sizes 300-400 ampere

AC/DC Welder 200 ampere combination



Gas Drive Size 300-400 & 600 ampere

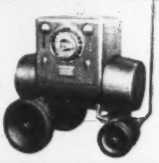
Get the arc welder that's RIGHT for you— ...get a HOBART!

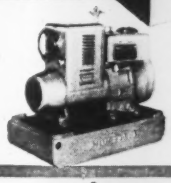
Hobart offers you the widest selection of arc welders on today's market. More than that, they offer the best welders . . . from which you can select exactly the right welder to meet your requirements, AC-DC or Combination—Automatic or Semi-Automatic.

Hobart welders have new convenience features, more "extras" are built in at the factory—giving you far more welder value, dollar for dollar.

Just compare Hobart with other welders—point for point. Then you'll see why Hobart has the fastest selling welder line and is so popular among leading industries everywhere.

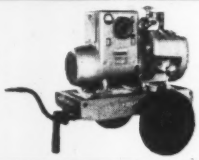
Electric Drive Sizes 200-300 400-600 ampere

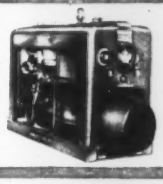




"Husky Boy" Air-cooled 200 amp.

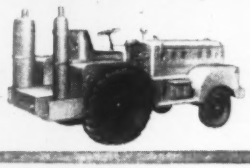
AC AC Welder for AC power or AC welding





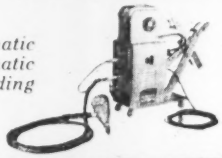
"Contractor's Special" Water-Cooled 250 amp. size

Weldmobile Sizes 400-600 ampere

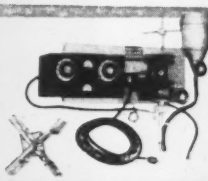


"Powromatic" for automatic arc welding

Handomatic Semi-Automatic arc welding



Fully Automatic submerged arc welding



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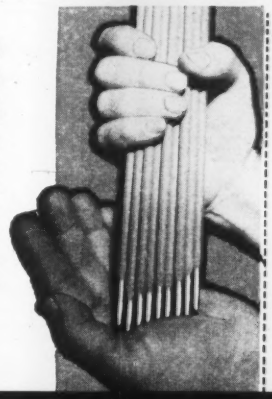
Weld faster with "ROCKET 24" iron powder ELECTRODES

A new contact type electrode heavily coated with iron powder which becomes part of the weld. Try some. See how they give you greater speed, maneuverability, strength and smoothness.



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- ☐ *AC Transformer*
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- ☐ *AC/AC Welder*
- ☐ *"Contractor's Special"*
- ☐ *Weldmobile*
- ☐ *"Powromatic"*
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GM-Specified
HYSUNITE Acid Hose
C
O
A
A Seamless tube of special synthetic rubber compound resists high concentrations of sulphuric, nitric and chromic acids at temperatures up to 100° F.
B Multiple plies of fabric reinforcement provide strength with maximum of flexibility
C Tough rubber cover resists abrasion and weather

Passes acid test—by more than 3 times

Unloading carloads of concentrated sulphuric acid proved a hose-killing job at this Gulf state fertilizer plant. Time after time, the acid charred the insides of a hose, making it brittle and easy to break. Even the best one could handle only 2,800 tons before it gave up the ghost.

Then the G.T.M.—Goodyear Technical Man—suggested HYSUNITE Hose. It's specially developed to carry highly oxidizing acids—even in high concentrations and at high temperatures hose could never before handle. How did HYSUNITE do there? *At last report, it had unloaded 9,900 tons. And it looks good for many more.*

Here's one more proof, then, that hose problems just don't come too tough for the G.T.M. Put him to the acid tests—no matter what your hose need—by contacting your Goodyear Distributor—or writing:

Goodyear, Industrial Products Division,
Akron 16, Ohio

HYSUNITE HOSE by

GOODYEAR

THE GREATEST NAME IN RUBBER

Hysunite—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

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WITH NEW
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EXTRA DUTY
FIRE BRICK
1. RESISTANCE TO PENETRATION
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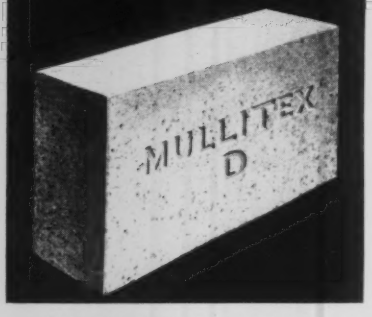

With the timely introduction of Mullitex D, Walsh now offers the Steel Industry a more complete line of Missouri-Quality super duty refractories. For all the money-saving facts, contact the nearest Walsh representative, or write for full particulars.

APEX, Extra Duty Stiff Mud Deaired Fire Brick, manufactured from super duty clays. Noted for resistance to slag penetration and metal wash.

MULLITEX HB, Super Duty High Burn Fire Brick, noted for high hot load bearing strength under soaking heat conditions.

Specialists in refractories of high bulk density and low porosity

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101 FERRY ST. • ST. LOUIS 7, MO.
FOR OVER 60 YEARS MANUFACTURERS
OF HIGH GRADE REFRACTORIES

behind the scenes

Recovers, Lands on Cover

Gran'paw, who was scarcely any longer than his army issue flintlock musket, always maintained stoutly that he could whip any man not more than twice his weight. "And I could do it with one hand tied behind me back!" That was peak performance for a man functioning with only one arm. There is a story about how Lord Nelson clapped a telescope to his blind eye and tried to pick up a flag signal ordering him to break off a naval engagement. "I can't see any signals!" he roared. "Stand by to come about, and cross the T!" For some reason not perfectly clear, naval heroes always crossed a T when they cleared for action, and we wouldn't want Lord Nelson to fumble at this point. In any event, here was a case of a man functioning at high level with only one eye.

The scene shifts now to Bridgeport, Conn. STEEL was anxious to interview Alfred V. Bodine (see this week's cover) president of the National Machine Tool Builders' Association, and president and treasurer of Bodine Corp., Bridgeport, Conn., so he was contacted by telephone and informed: "We are preparing a roundup on capital equipment, sir, and would appreciate your views."

Results of that interview appear on Page 47 (outlook for capital equipment, a staff report). Mr. Bodine analyzed the machine tool business. He assessed the meaning of its downtrend, and explained why replacement and re-equipment had replaced expansion as market potentials. As befits his high office and wide responsibilities, Mr. Bodine was incisively instructive; he was operating at peak efficiency, even though he was sitting at home with a broken leg!

There should be a lesson here, or a moral, or something, and we mentioned as much to Alfred Baker, composing room foreman, when he tossed some proofs on our desk. He favored us with the sort of a stare Dracula might have bestowed upon a fat young gentleman with high blood pressure. "I can't say about the high efficiency," he said. "I don't know, but it seems to me you've been operating around 'ere for quite a spell with 'oles in your 'ead, and nobody seems to be getting excited."

Rock'n'Roll to Rocket Racket

Jack Botzum, STEEL's Washington editor and this column's federal spy, recently sent us a copy of the latest drinking song to hit Washington. Jack may have overlooked the damning fact that his confessed knowlege of questionable diversions beyond the field of metalworking places him, ipso facto, in an awkward position. Indeed, one of the verses he included could never appear in the chaste pages of STEEL, in spite of the provisions of the first amendment to the U. S. Constitution and the success of a thing called *Peyton Place*.

The drinkers (pardon, singers!) begin with a countdown and a vigorous slap on the table or bar at the word "Bang!"

Ten! Nine! Eight! Seven! Six! Five! Four!
Three! Two! One! Bang!
With a whoosh and a bang away we go
To our orbital course in the sky.
Where we look at the people down below,
But never, never spy! (Well, hardly ever spy!)

We fill our craws with the strangest men
Whose chains are loose on their sprockets;
They smoke till they never need oxygen
As they orbit around in their rockets.
They ride on rollicking think machines
To the farthest astral spaces!
They're never troubled by qualms or fears,
For they never leave their places.

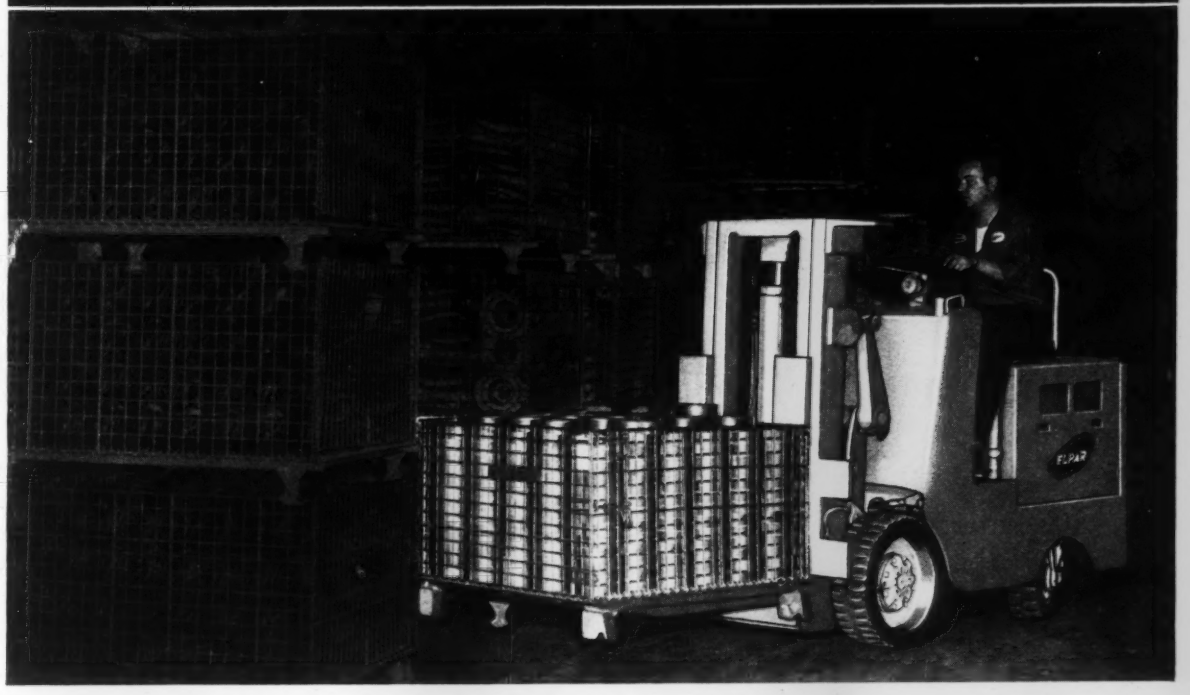
Something About a Bunch of Nuts

Here is the puzzle that Richard Raper, assistant general manager, Wheeling Steel Corp., Steelcrete Factory, Wheeling, W. Va., was kind enough to send in a few weeks ago. So what if it isn't brand new? It's still tough. Five sailors, A, B, C, D, and E were shipwrecked on a tropical isle. On the first day of their deliverance, they gathered coconuts and stacked them in a community pile, intending to divide them the following day. During the night, A decided to take out his share, so he rose stealthily and divided the pile into five equal parts. One nut was left over, so he threw it into the ocean. He hid his fifth, kicked the remaining coconuts into a single pile, and went back to sleep. Similarly, B, C, D, and E rose stealthily in turn and repeated A's performance: Each divided the pile into five parts, each had one coconut left over (which was tossed into the ocean), and each hid his fifth, leaving the remaining nuts in one heap. In the morning what was left of the original pile was divided into five equal parts, which came out even. How many coconuts were in the original pile, and how many did each sailor have?

Shrdlu

(Metalworking Outlook—Page 41)

ELPAR ELECTRIC TRUCKS...



Save $1,200 Per Truck Per Year

Cost surveys made at a number of plants reveal that ELPAR electric trucks cost one-third less to operate and maintain than comparable gas models. Based on 2,000 hours of operation, this means an average saving of more than $1,200 per truck per year.

In addition, ELPAR electrics give twice as many years of dependable service as gas trucks operating under similar conditions. Thus, when *all* initial and replacement costs are added up, ELPAR electric trucks actually cost *less* to buy.

And, the surveys show that average downtime for ELPAR electrics is 2 to 3% while that for gas trucks is 10 to 15%.

More and more companies are converting their fleets to dependable, fume-free ELPAR trucks. Join the trend. Choose from our complete line of fork and ram trucks, low lift and high lift platform trucks, and mobile cranes—and save on *first* cost and *operating* cost. Get all the facts. . .

WRITE FOR YOUR COPIES
of the ELPAR *Lift,* "Gas vs. Electric Trucks" and "LP-Gas vs. Electric Trucks."

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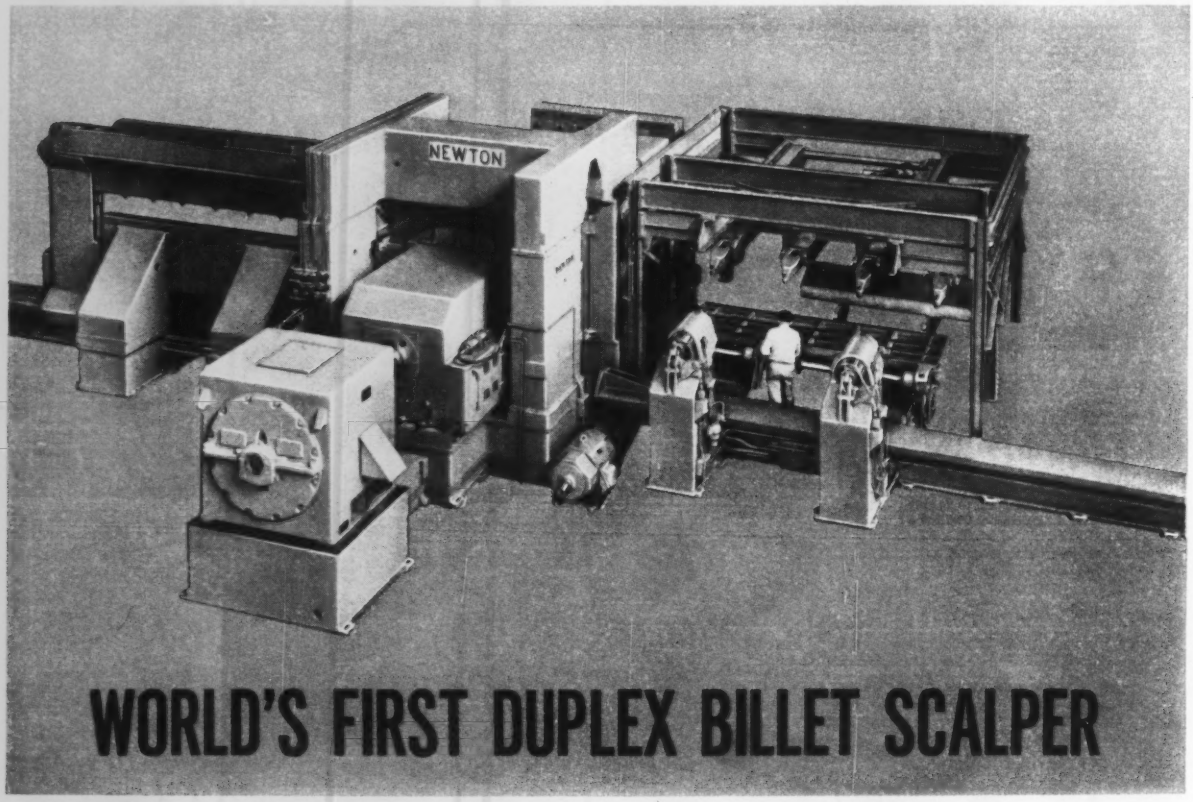
Twice the Life . . . 1/3rd the Operating Costs



WORLD'S FIRST DUPLEX BILLET SCALPER

provides revolutionary savings in milling time

Above is the Newton® 75-inch billet scalper... first machine ever devised for the simultaneous scalping of both sides of aluminum billets. Featuring a completely automated operating cycle—from loading to unloading—it is designed to mill 3/8" from each side, in a single pass, *in 1½ minutes floor-to-floor time.*

Besides providing amazing savings in scalping time, the machine offers two other big advantages. 1. Cutting knives and cutter rings have been designed to minimize the time needed to remove knives, regrind and reassemble them. 2. The danger of marring already milled surfaces, during the operation, has been completely eliminated. Thus, both operating cycle and maintenance time have been importantly reduced, while quality of finished surface is protected.

Although this first machine was developed for scalping aluminum, the design is adaptable to other metals and alloys. It can also be built to mill edges as well as sides.

Write for further information on how to cut your scalping time with a Newton duplex machine. Ask for bulletin 74-C-583.

CONSOLIDATED MACHINE TOOL DIVISION
FARREL-BIRMINGHAM COMPANY, INC.
Rochester 10, New York
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

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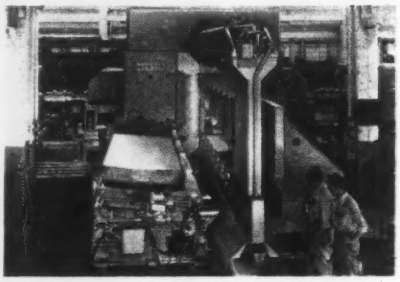
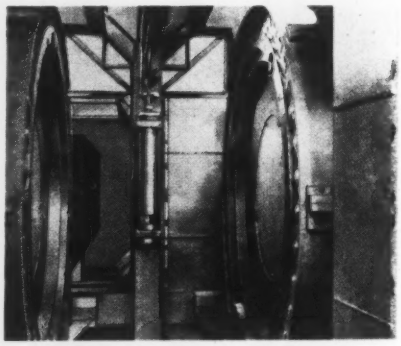


Rough billet on the loading leaf of the Newton billet scalper.



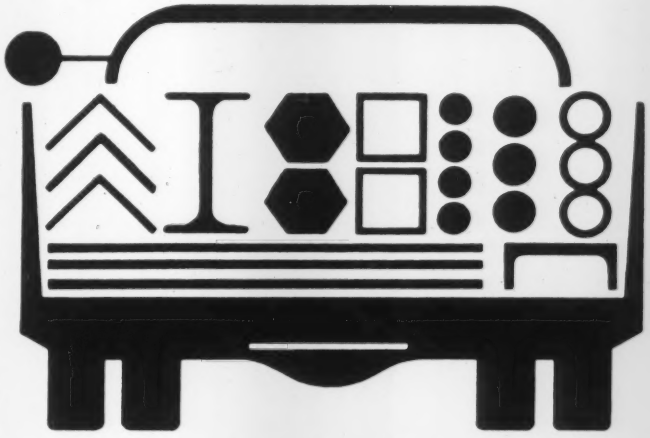
End view of the moving fixture with cutters retracted. Cutters, which are 75" in diameter, are the largest milling cutters ever built.

CM-27

You can depend on

YOUR STEEL SERVICE CENTER

AMERICAN STEEL



WAREHOUSE ASS'N.

"For want of a bar — a job may be lost"

Forget your worries, and let your local distributor "take over" in keeping your production line supplied with the right steels . . . tailored to your order and timed to your schedules.

This modern steel warehousing service adds to your efficiency and profits. It eases the "pressure" on the busy manufacturer, and pays off on rush orders where a lack of steel might stall an important job.

Your local distributor carries large inventories so you don't have to waste space or tie up capital in surplus stocks. His warehouse is your stockroom with thousands of steel items within phone call.

This friendly, cost-saving service is an asset to your business... use it!

Whenever you need advice on selection of steel grades or methods of fabrication, just call your local distributor. He will be glad to help you.

LUSTERIZED FINISH COLD DRAWN BARS

BLISS & LAUGHLIN, INC.

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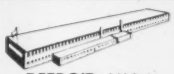
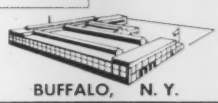


DETROIT, MICH.



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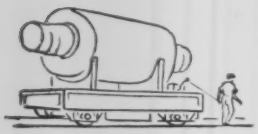
ATLAS SAFETY TYPE



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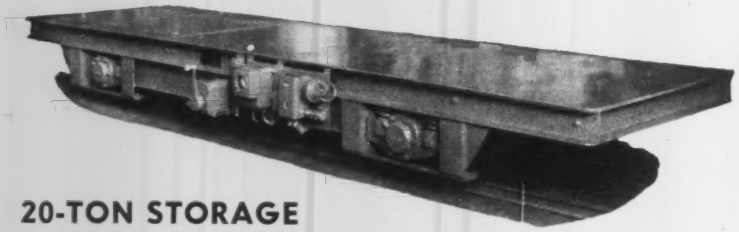
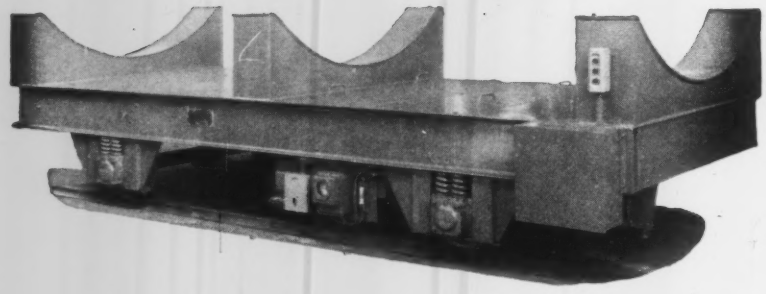


20-TON STORAGE BATTERY FLAT CAR



20-TON STORAGE BATTERY WITH CRADLE FOR PIPE

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

Article Stirs Interest

From the standpoint of the investment casting industry, I think your article, "Investment Castings Go Civilian" (Mar. 3, Page 95), is well presented and should provoke much thought by production engineers and buyers in all industries. Investment castings have a place not only in product components but also in general manufacturing tooling and special machinery.

We have evidence that the article stirred an interest. We received calls three days after its publication to visit the plants of potential customers. Some of their high cost items were evaluated as potential investment castings for cost reduction.

I think your publication is doing a great service to its readers and to the "special process industries" (including our own) in your Production Ideas series.

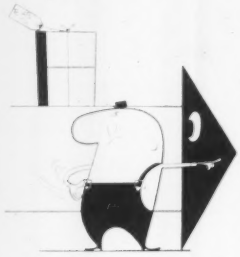
R. R. Stough
Sales Engineer
Precision Metalsmiths Inc.
Cleveland

Cost Crisis Contest Is Timely

Your Cost Crisis Competition is a timely one and provides a much needed incentive for industry. Since our operations cover more than a single profit department, we would like six award kits.

W. E. Collar
Manager, Mfg. Engineering Dept.
Westinghouse Electric Corp.
East Pittsburgh, Pa.

Lauds Production Control



Your excellent Program for Management article, "Production Control for Profits" (Mar. 17, Page 83), is one of the best articles on this subject I have seen.

A. C. Wedge
Vice President-Mfg.
DeWalt Div.
American Machine & Foundry Co.
Lancaster, Pa.

Invaluable Information

We have been following your five-part article, "How To Weld Copper and Its Alloys" (beginning in your Jan. 27 issue, Page 86), with considerable interest. Our operations in Arabia utilize copper and

(Please turn to Page 12)

"These 'super-speed' inclinables give me twice the production . . . at about half the cost!"

From their special vibration-absorbing legs to their counterbalanced shafts, these presses are built for speed.

With such special features as bronze gibs... automatic lube systems... special clutches, brakes and flywheels, and equipped with precision feeds, they can knock out short stroke work at better than 500 strokes a minute! They're all new, all Bliss, and the cost is low—surprisingly so.

These are the latest members of Bliss' line—the line that offers industry its most complete choice of types and sizes. And with no axe to grind for any one type, you can be sure of impartial pressroom counsel—by Bliss.

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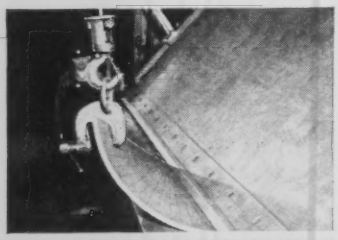
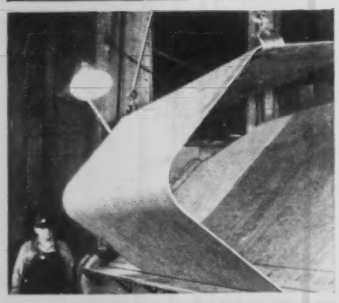
Bending Steel Plates for WELDMENTS?

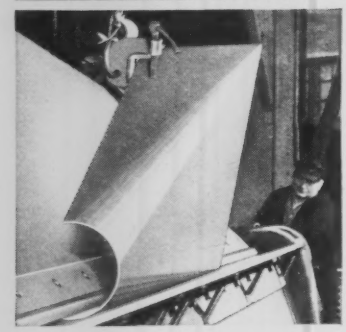
do it economically with

CHICAGO® POWER BENDING BRAKE

(no dies needed)





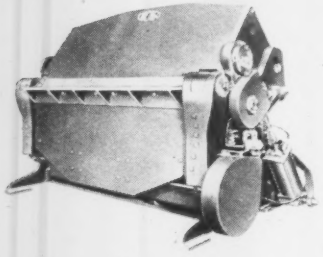


The accompanying illustrations give an idea of the versatility of the CHICAGO bending brake. No dies have to be changed or adjusted—no dies are used on these jobs. Yet, duplication is easily obtained on successive pieces. The machine is quickly adjustable for different thicknesses of material up to rated capacity. Automatic stop regulates the angle of bend. This, too, is adjustable to any degree of bend. The ease of changing from one job to another and the elimination of die costs make the CHICAGO bending brake the economical method for bending steel plates for weldments.

Many standard sizes are available with capacities for bending mild steel up to 12 feet by ¾ inch or 16 feet by ½ inch. Also many standard sizes in hand and power operated models for sheet metal.

BULLETIN P-55
This bulletin gives the details of how these and many other jobs are handled. Also complete description of the machine and specifications of the standard sizes.
Ask for a copy.

Front view of one of the heavy duty models of CHICAGO power bending brake showing the operation end of the machine.



Recommendations for any job on request.

6473

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Hand and Power Brakes • Special Metal-Forming Machines

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7458 South Loomis Boulevard, Chicago 36, Illinois

LETTERS

(Concluded from Page 10)

its alloys in many processes. Information of the type presented by you is invaluable to us.

W. W. Fillmore
Arabian American Oil Co.
New York

Excellent Short Report

Your article, "Trademarks Help You Sell" (Mar. 17, Page 54), is an excellent, short, understandable write-up.

R. L. Sayre
Director, New Products Development
Heekin Can Co.
Cincinnati

Management Likes Article

Your Program for Management article, "Balance Your Management" (Feb. 17, Page 113), had excellent reception by our management.

John P. Nally
Advertising Manager
Rochester Products Div.
General Motors Corp.
Rochester, N. Y.

• • •

I have read your article and think it is an excellent treatment.

Carlton M. Barlow
Director of Personnel Development
General Dynamics Corp.
New York

Sylvania Is Steel Producer

Your article, "Stainless Steel" (Nov. 4, Page 107), failed to mention us as a stainless steel producer. We would appreciate inclusion of our Parts Div., Warren, Pa., as a producer of "drawn wire" in any subsequent listings.

James J. Lanigan
Project Manager
Public Relations Dept.
Sylvania Electric Products Inc.
New York

Helpful to Small Business

The article, "Your Missile Scoreboard" (Oct. 7, Page 120), has aroused a considerable amount of interest among smaller business people and has been helpful to them. It has also been helpful to us in offering advice to contractors.

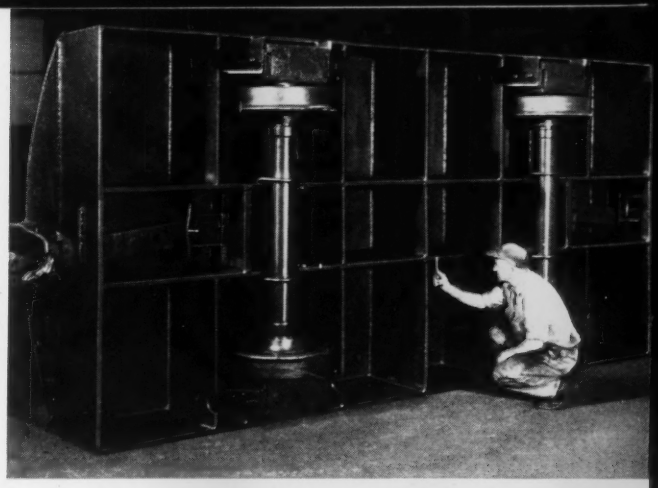
S. P. Fisher Jr.
Chief, Procurement Section
Procurement & Technical Assistance Div.
Regional Office
Small Business Administration
Cleveland

Management Series Interesting

We find your articles in the Program for Management series interesting. I am keeping a file of the articles which should be quite valuable.

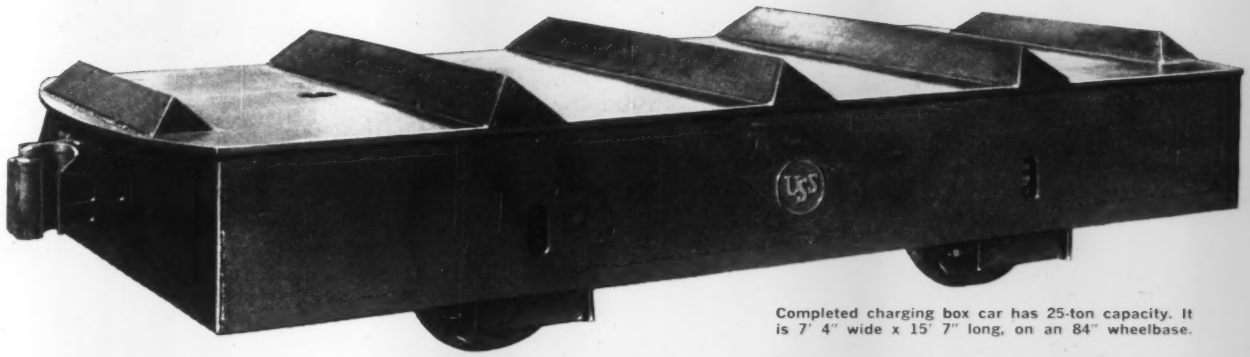
H. M. Appleton
Manager, Industrial Engineering
Permutit Co.
Division of Pfaudler Permutit Inc.
Lancaster, Pa.

Welding underside of car. Steel plate of all-welded car is ¾" to 1¼" thick. Side plates and deck are 1" steel; end plates are 1¼".



Checking thickness of steel underframe. Longitudinal members are 1" plate and the spacers are ¾" plate.

Charging Box Cars . . . built to last by steelmakers who "treat 'em rough"



Completed charging box car has 25-ton capacity. It is 7' 4" wide x 15' 7" long, on an 84" wheelbase.

Nowhere else do industrial cars take more punishment than in our own United States Steel plants. And, in the 36 years we have been making industrial cars for our own use, United States Steel has acquired vast experience from which to design and build all kinds of industrial cars that will more than meet our customers' service requirements.

A good example of USS-Designed Industrial Cars is the four-unit Charging Box Car shown above. It is an all-welded, rolled steel plate car with heavy-duty running gear—equipped with anti-friction outboard bearings—and rugged underframing. Designed for operation on standard gage track, this car weighs 20,300 pounds, unladen, and will easily carry 25 tons.

Capacity, running gear, and other design features can be modified to meet your specific needs. In short, every USS Industrial Car is "tailor made."

Our Engineers will be pleased to call at your convenience to discuss your requirements for industrial cars. Meanwhile, send for a free copy of our 32-page illustrated booklet—**"USS Custom Designed Cars."**

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Republic's new slotted construction angle for all your framing needs

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The secret is the precision engineered, unique system of short slots. Placed to allow ¾" Vertical and Horizontal adjustment, they assure utmost flexibility in meeting design requirements. Two-way pattern of short slots provides sufficient bolts in bearing to assure adequate joint strength.

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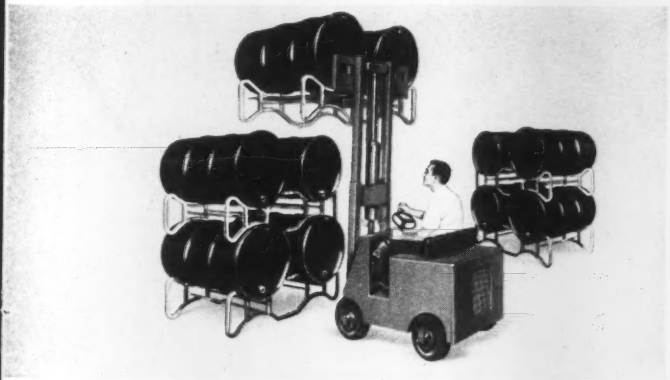
BILD-A-FLEX structures are strong, durable and economical. Keep several bundles on hand for in-plant utility. There's no waste with BILD-A-FLEX; when the job is done, your BILD-A-FLFX angles are re-useable. Competent Berger representatives will assist you in designing complete layouts and structures. BILD-A-FLEX angles are stocked for your convenience in ten well-located Republic Warehouses. Save yourself time, space and money. Send coupon for idea-packed catalog.



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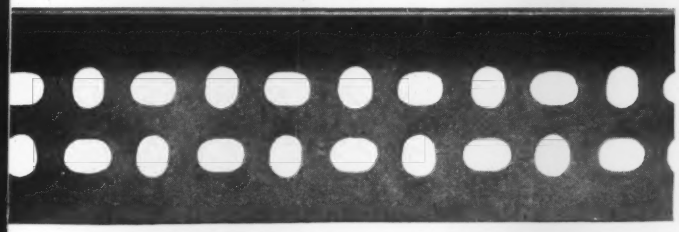
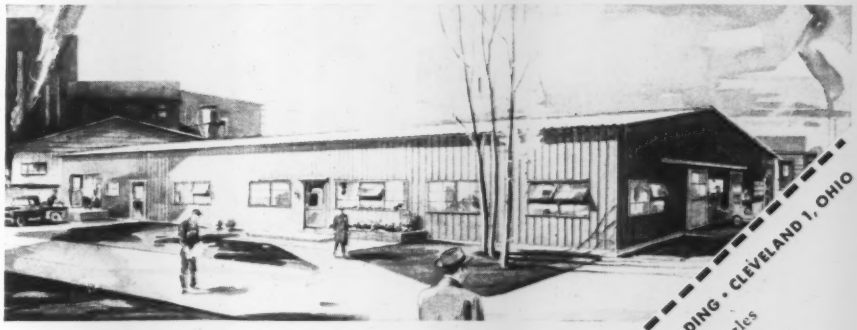


DESIGNED FOR HEAVY-DUTY SERVICE. Republic's PB-127 Collapsible Box is ideally suited to shipping castings and other heavy items. It can be tiered when loaded or empty, collapsed or set-up. It offers up to 66⅔% saving in storage space. All parts are permanently attached. It's another item in Republic's big line of materials handling equipment that assures long, efficient service at lowest per-year cost. See your dealer, or send coupon.

TRUSCON COMPLETE STEEL BUILDING. LOW IN COST, QUICKLY ERECTED, REUSEABLE. Here's a "budget building" in every sense of the word. Can be shipped complete to your site, quickly erected. Truscon quality design and fabrication. Mass-production of standard steel components keeps costs low. Siding, roofing, windows, doors, hardware all included. 32- to 48-feet wide; as long as you want it. Send coupon for bulletin.



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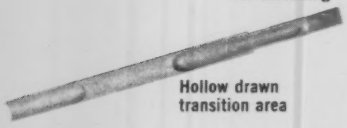

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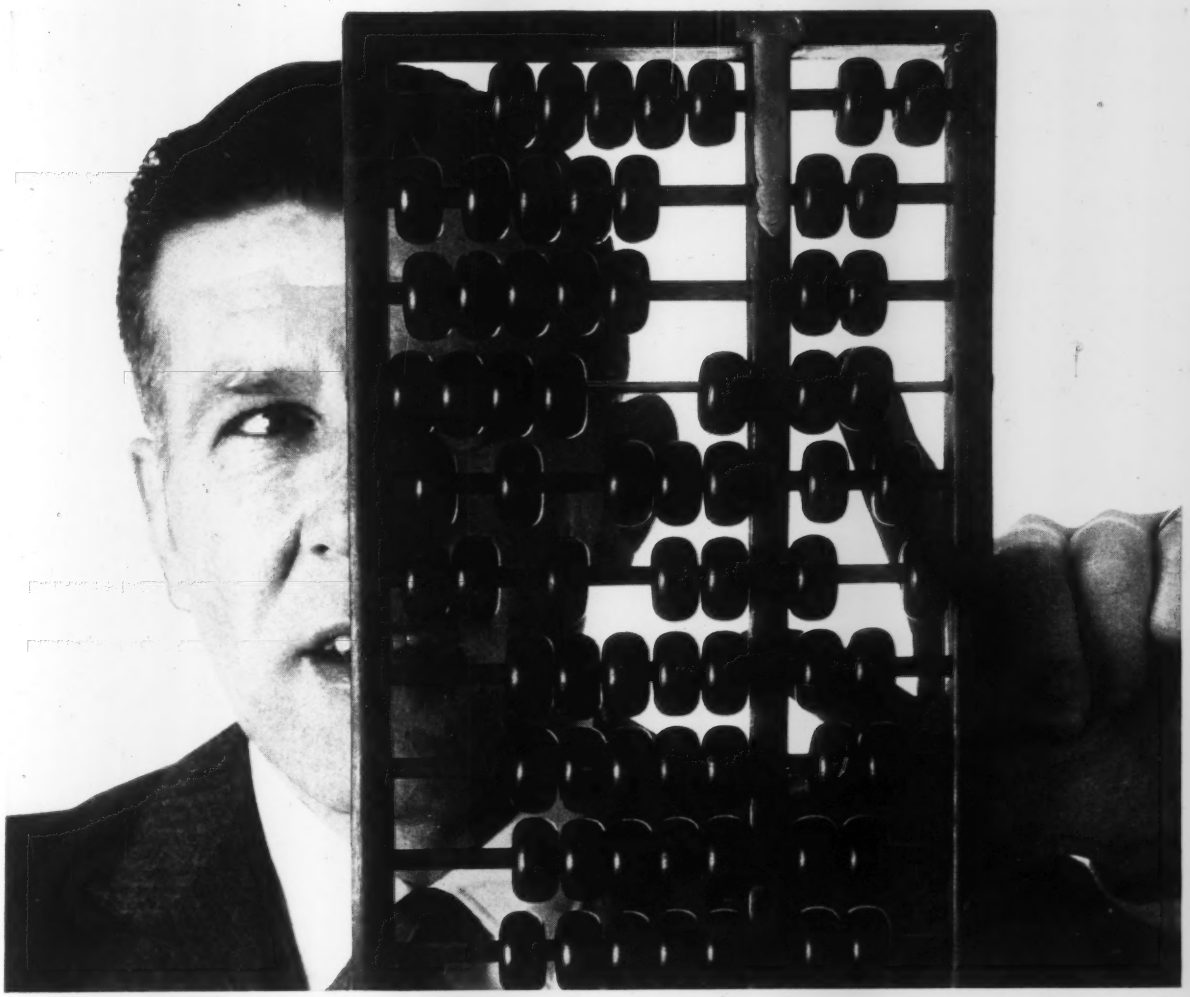

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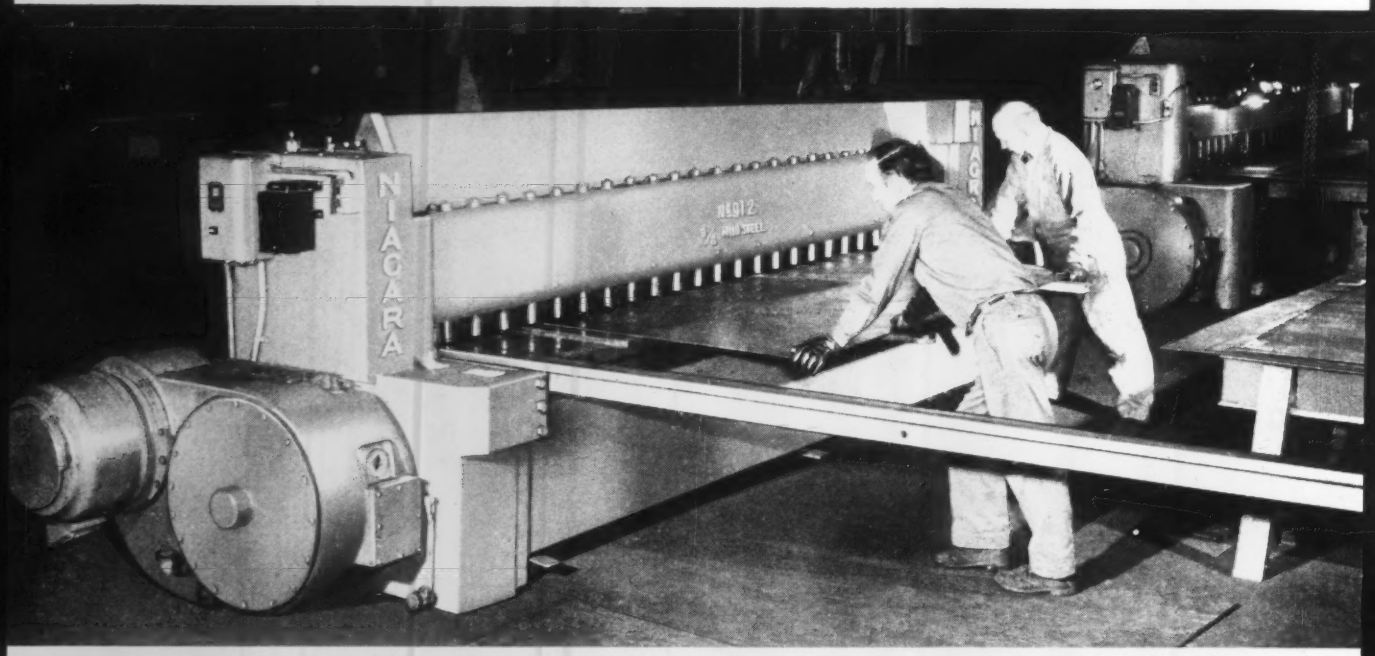
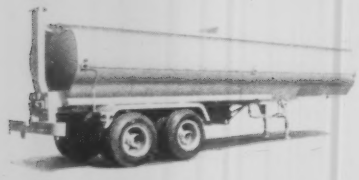
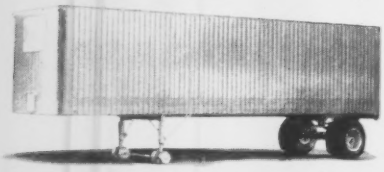
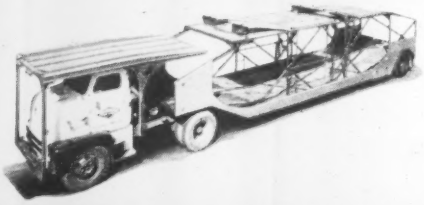


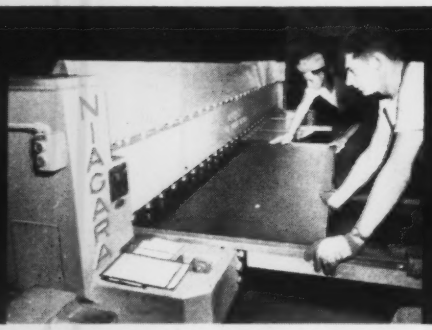
Niagara Model 912 shearing 18" x 30" transition plates from 10 gage hot-rolled steel for tank trailer frames.



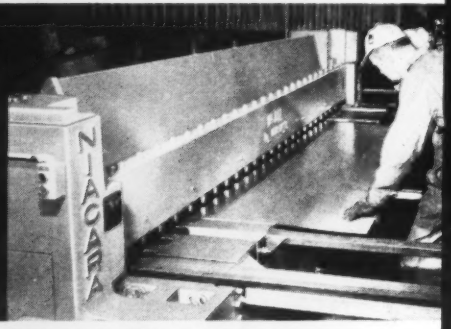




Niagara Model 96 cutting forty 4" x 6" trailer gussets per minute from ⅜" and ½" bar stock.



Niagara Model 812 shearing 11 gage hot-rolled steel to 36" x 144" for trailer floor beams.



Niagara Model 812 at work shearing 24 gage stainless steel to 4' x 6'6" for van trailer door panels. Production: 2.7 pieces sheared all 4 sides per minute.

NIAGARA power squaring shears

America's most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work.

"exceptional machine value"

World's largest trailer manufacturer spells out its reasons for using Niagara Underdrive Shears in producing a wide variety of parts from cold-rolled and hot-rolled steels, stainless and aluminum

As a metal fabricator, Fruehauf Trailer Company is well-qualified to speak. It not only manufactures every conceivable type of commercial trailer, but "builds more of them than any company in the world."

So, when it comes to power squaring shears, Fruehauf is particularly qualified to speak. Using several Niagara Models, it considers them an "exceptional machine value."

Enlarging on the point, Fruehauf engineers say, "Niagara Shears are capable of holding straight lines within thousandths of an inch . . . they keep their settings . . . trouble-free, they require a minimum of maintenance.

"They're well-balanced . . . can be moved about . . . require no special concrete base. We especially like their minimum height . . . can see over them. It's unlikely that an operator will step out from the shear in the path of a fork lift."

Like Fruehauf, progressive companies everywhere look to Niagara for exceptional machine value in a power squaring shear. Here are a few of the reasons:

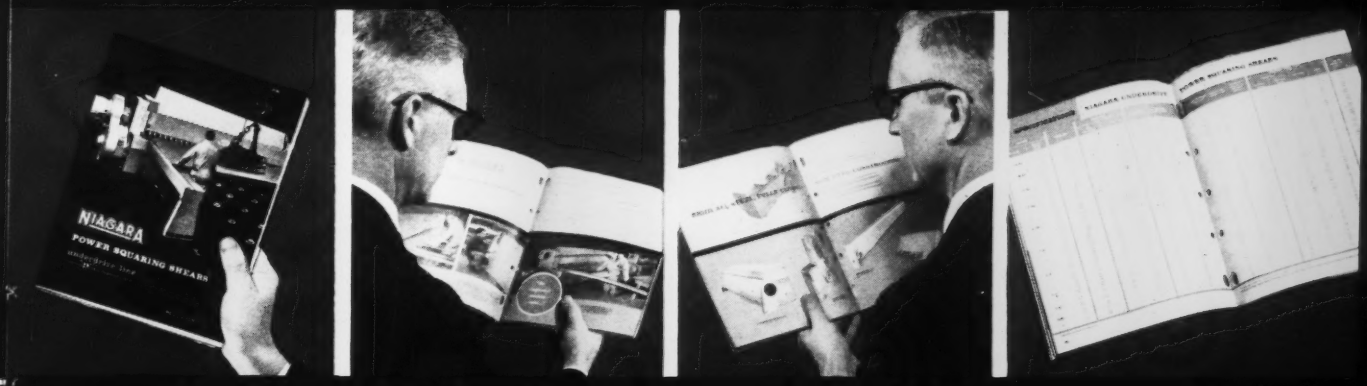
TAKE ACCURACY! Niagara's positive, power actuated, self-compensating holddown grips work securely. Fully closed box section construction of bed, crosshead, holddown and housings resists all stresses with minimum deflection.

TAKE SPEED! More working strokes per minute and instant engagement of Niagara's exclusive multi-point sleeve clutch assure more cuts per hour. Full visibility of the cutting line, ease of operation, quick setting gages and safety features boost hourly output.

TAKE MAINTENANCE! Niagara Shears are built to stand the gaff on the toughest jobs. Simplicity of design involving a minimum number of parts, and utmost accessibility cut out costly maintenance.

Any way you look at it, Niagara has the most to offer you in modern shear performance.

NIAGARA'S NEW, FACT-FILLED BULLETIN WILL GIVE YOU THE FULL STORY



74 Pages — 141 Illustrations . . . Most Comprehensive Shear Bulletin Ever Published . . . 19 Photo Reports of Niagara Shears In Action . . . 44 Revealing Views of Niagara Shear Features . . . Easy-to-read Specs For America's Most Complete Underdrive Line (59 Models, Capacities: 16 gage to 1", Cutting Lengths: 4' to 20')

CLIP THIS COUPON FOR YOUR COPY TODAY!

see what America's most modern power squaring shears can do for you

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

MAIL your new Underdrive Squaring Shear Bulletin 69G to us immediately.

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COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Genuine ALLENs for your king-size holding jobs now available from stock!

1¼" and 1½" sizes are standard

These applications show you the great variety of holding jobs for which designers and engineers are specifying these rugged king-size Allen Hex-Socket Cap Screws. They're genuine Allens, from their heads to their Leader Points. Pressur-formd, to preserve the long fibers uncut throughout their lengths. Highly accurate threads. Leader Points, of course—for fast, true starting. 1¼" and 1½" diameters available immediately from stock—larger diameters are available on special order.

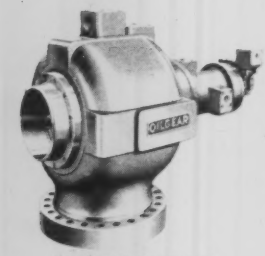


PHOTO: THE OILGEAR CO.

King-size Allen Hex-Socket Cap Screws are used to secure the flanges in this big 12-inch 3000 psi Oilgear Surge Valve.

PHOTO: GOODMAN MFG. CO.

King-size Allens secure cutter arms, tilting arms, and elevating cylinders in this massive Goodman Continuous Mining Machine.

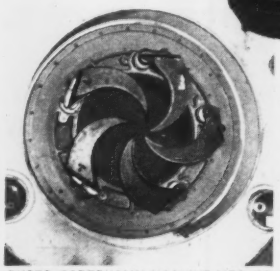


PHOTO: SODERHAMN MACHINE MFG. CO.

King-size Allen Cap Screws securely clamp the knives of this large and unusual machine that debarks whole trees.

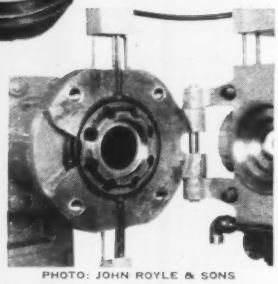


PHOTO: JOHN ROYLE & SONS

King-size Allens in the side-delivery Extruding Head of this Royle machine for application of rubber or plastic in solution.

The cost of Allen Hex-Socket Cap Screws is only a minor fraction of your assembly costs . . . be sure you're getting the timesaving, cost saving advantages of genuine Allens!

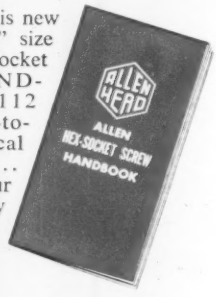
ALLEN GRIP HEAD CAP SCREWS—known throughout industry as fastest, easiest starting, firmest holding. Standard sizes from No. 0 to 1½" diameters.

ALLEN FLAT HEAD CAP SCREWS—for streamlined, flush-fastening of thin plates, moldings, etc. Standard sizes from No. 4 through ¾" diameters.

ALLEN BUTTON HEAD CAP SCREWS—for streamlined, snag-free, unbroken surfaces where countersinking is impractical. Standard sizes from No. 4 through ⅜" diameters.

ALLEN STAINLESS STEEL CAP SCREWS—for applications where bright finish, or rust and corrosion resistance is essential. Standard sizes from No. 0 to ⅜" diameters.

FREE! . . . this new "vest-pocket" size Allen Hex-Socket Screw HANDBOOK . . . 112 pages of up-to-date technical information . . . Send for your free copy today.

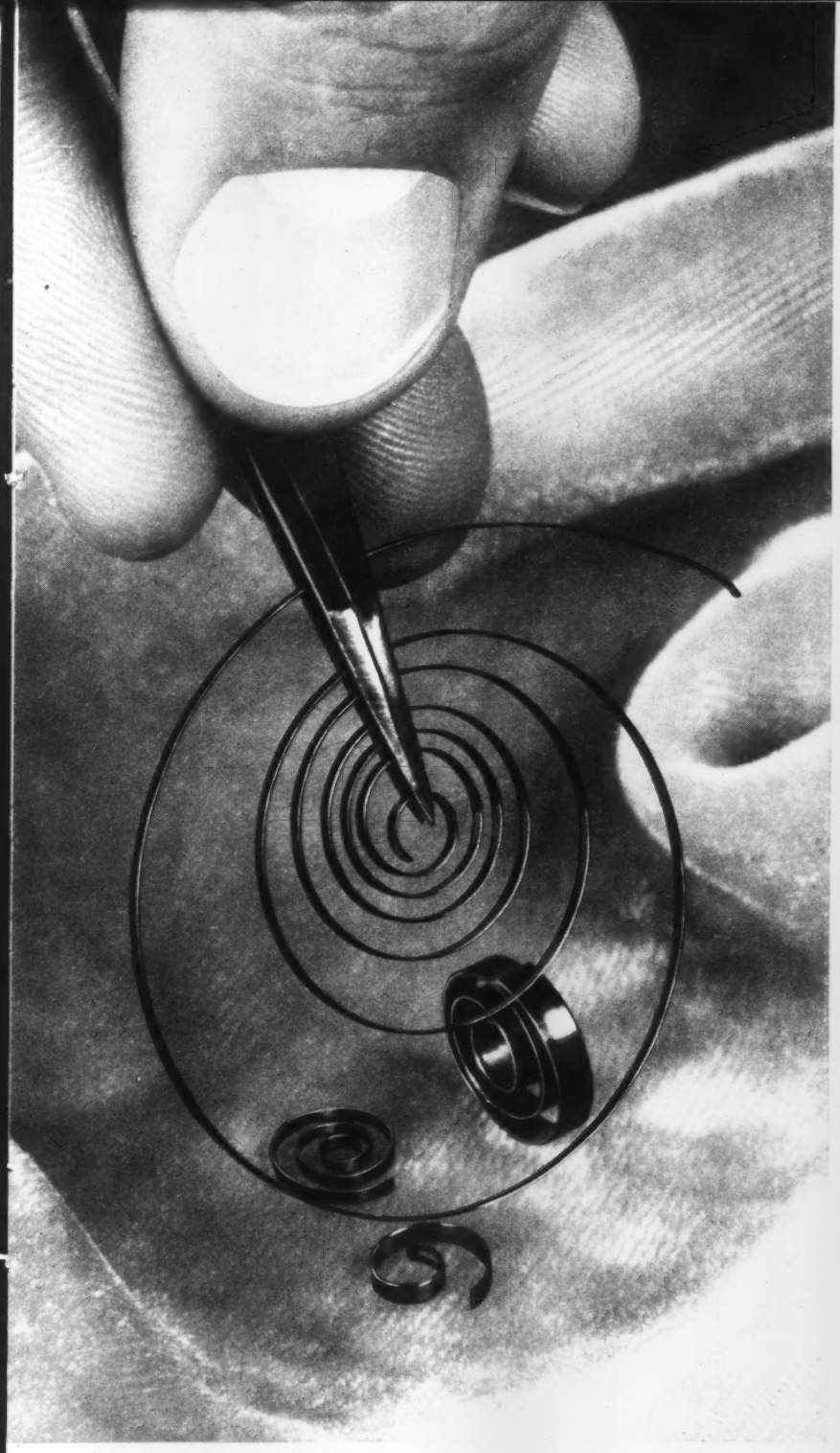


ALLEN MANUFACTURING COMPANY

Hartford 2, Connecticut, U. S. A.

Stocked and sold by leading industrial distributors everywhere

ALLEN HEAD HEX-SOCKET SCREWS



For spring life everlasting...

NILCOR* ALLOY!

Nilcor alloy is not a steel! It is truly unique. It is believed to have no equal, for example, for continuous life in miniature springs. Further, it is non-magnetic and far outdistances steel or any known alloy in resistance to "set", fatigue and corrosion . . . even at high temperatures.

Major use to date is for non-breakable power springs in fine watches. But more and more Nilcor alloy is and will be furnished for the most critical requirements in instrumentation, control devices and equipment of many types . . . wherever extreme spring life and precise behavior are vital.

Perhaps National-Standard Nilcor alloy holds promise for some of your needs. We shall certainly be glad to cooperate *all* the way in helping you find out. Just check with our Athenia Steel Div., Clifton, New Jersey.

*Trade Mark National-Standard Co.

NATIONAL NS STANDARD

DIVISIONS: **NATIONAL-STANDARD, Niles Mich.**: *tire wire, stainless, music spring and plated wires* · **ATHENIA STEEL, Clifton, N. J.**: *flat, high carbon spring steels*
WAGNER LITHO MACHINERY, Secaucus, N. J.: *metal decorating equipment* · **REYNOLDS WIRE, Dixon, Ill.**: *industrial wire cloth*
WORCESTER WIRE WORKS, Worcester, Mass.: *music spring, stainless and plated wires, high and low carbon specialties*

Parts made by almost every industry have holes made by a KINGSBURY

From the carburetor body to the lock cylinder . . . the bearing race to the hammer head . . . would just be a variety of parts — except for one important advantage in common:

the drilling and tapping operations were completed faster, at lower cost per operation, with unvarying accuracy — in every single part — because an automatic Kingsbury machine did them.

This can mean a distinct manufacturing advantage to *you*, if you have high production drilling, tapping, reaming, spot facing, light milling and similar operations to do on your parts. You can do them at the *rates you need*, at the *lowest practical cost, month in and month out*, on a Kingsbury indexing automatic.

"Kingsbury jobs" — as the automotive and appliance industries frequently call them — are typically done in this manner: The manufacturer sends Kingsbury a print (or sample) of his part, specifying operations and the production rate required. Kingsbury then incorporates the appropriate standard operating units, base, indexing unit and drive, to build an automatic drilling and tapping machine *to do what the customer wants, at the rate he wants.* Test runs by Kingsbury *before* shipment, and *delivery of a fully tooled machine* ready to produce, provide positive assurance that performance will match production requirements.

Whether you make automotive, plumbing, hardware, machine, electrical appliance or some other kind of parts, investigate the production and cost benefits in doing the drilling and tapping on a Kingsbury. Send your requirements and questions to Kingsbury Machine Tool Corporation, Keene, N. H.

KINGSBURY

INDEXING AUTOMATICS
for high production drilling and tapping

CALENDAR
OF MEETINGS

Mar. 31-Apr. 2, American Management Association: Special conference on purchasing, Palmer House, Chicago. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Mar. 31-Apr. 2, Gas Appliance Manufacturers Association: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 60 E. 42nd St., New York 17, N. Y. Secretary: Harold Massey.

Mar. 31-Apr. 2, Society of Automotive Engineers: National production meeting and forum, Drake Hotel, Chicago. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Apr. 2-4, American Management Association: Special conference on plant location, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Apr. 6-12, Concrete Reinforcing Steel Institute: Annual meeting, Boca Raton Hotel, Boca Raton, Fla. Institute's address: 38 S. Dearborn St., Chicago 3, Ill. Managing director: H. C. Delzell.

Apr. 7-8, Wire Reinforcement Institute Inc.: Annual meeting, Boca Raton Hotel, Boca Raton, Fla. Institute's address: National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.

Apr. 8, Material Handling Institute Inc.: Spring membership and directors' meeting, Cleveland Hotel, Cleveland. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

Apr. 8-9, Industrial Truck Association: Spring meeting, Hotel Cleveland, Cleveland. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Apr. 8-10, Industrial Fasteners Institute: Annual meeting, Boca Raton Hotel, Boca Raton, Fla. Institute's address: 1517 Terminal Tower, Cleveland 13, Ohio. Secretary: James J. Whitsett.

Apr. 8-11, Society of Automotive Engineers: Aeronautic meeting and production forum and aircraft engineering display, Hotel Commodore, New York. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

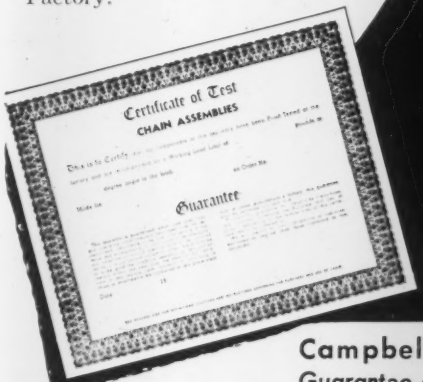
Apr. 9-10, Malleable Founders' Society: Market development conference, Edgewater Beach Hotel, Chicago. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Apr. 13-16, American Chemical Society: Annual meeting, San Francisco. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Campbell "Customized" Sling Chains

PUT THE ASSEMBLY YOU NEED "YESTERDAY" ON THE JOB TODAY!

Now, the new Campbell "Customized" Sling Chain Assembly Program gives you sling chains as you want them . . . when you want them. Here's how this fast, flexible service works for you. You can: a) maintain your own stock of Campbell component parts; and assemble slings right on-the-job; b) get immediate delivery on assemblies and components from your Campbell Distributor; c) get immediate shipment ordered through your Campbell Distributor on slings made-up at the nearest Campbell Warehouse or Factory.



Campbell Certificate of Test:
Guarantee of Performance

Campbell Certificates of Test protect you both for Campbell component parts, and the complete "Customized" Assemblies you get from your Campbell Chain Distributor or Warehouse. Call your Distributor for details on how the Program meets the requirements of *your* operation.

SEND TODAY for your free copy of
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CAMPBELL CHAIN

CAMPBELL CHAIN *Company*
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Here's a NEW WELDING TORCH that's WATERTIGHT... built for HEAVY-DUTY SERVICE ...yet weighs only 7 OUNCES!

This new HELIARC HW-18 Hand Welding Torch weighs only 7 ounces, making it easy for you to handle, less tiring. The special one-piece water cooling channel eliminates sources of leakage. And it's made for rugged, heavy-duty service.

YOU GET BETTER SHIELDING WITH LESS GAS

Improved design of collet body and closer electrode fit assure uniform argon flow, without jetting or turbulence.

◀ Diagram shows leakproof, one-piece water cooling passage in LINDE's new HELIARC HW-18 Hand Welding Torch.

GIVES YOU RUGGED SERVICE

Torch body is Fiberglas-reinforced phenolic for greater resistance to heat and thermal shock. Handle is tough, polished plastic. Gas cups have 4 times the impact strength of ordinary cups.

LEAKPROOF

Molded, one-piece water cooling passage has no joints to permit leakage—no water drip to contaminate welds.

EASY, MORE ECONOMICAL MAINTENANCE

Collets, collet bodies, cups and caps are interchangeable with those of your HW-17 Series 2 Torch. All couplings have standard IAA connections, and adaptors are included. Your production costs are lowered, too, for the new HW-18 saves time in hard-to-reach spots. Torch is designed for continuous 300-amp service, a-c or d-c.

ARGON SHUT-OFF VALVE

(Optional) saves time, steps and argon.

See and try this new HELIARC HW-18 Torch! For a demonstration, mail coupon today. Or call your distributor or nearest LINDE office. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.

Dept. ST35, LINDE COMPANY, Division of UCC
30 East 42nd Street, New York 17, N. Y.

Please advise me where and when I can examine and try out the new HELIARC HW-18 Hand Welding Torch.

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COMPANY

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FOR THE BEST IN ELECTRIC WELDING LOOK TO Linde TRADE MARK

UNION CARBIDE

The terms "Linde," "Heliarc," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

New Athey PW20 dump trailer built 11,000 pounds lighter with USS "T-1" Steel; has lower operating costs and new 3rd (or rear) door design.

Hauls payload over 3½ times its own weight!

—built entirely from USS "T-1" Steel

This new Athey Bottom Dump Trailer is unique. It weighs only 22,500 pounds but has a payload capacity over 3½ times as great: 80,000 pounds. According to the manufacturer, this high ratio of payload to weight is unequaled by any similar equipment.

Trailer weight reduced by 11,000 pounds. That's a lot of weight to take out of a trailer, but the job was done by using USS "T-1"* Steel throughout. This steel has high impact abrasion resistance and nearly three times the yield strength of structural carbon steel. This permitted reduction in plate thicknesses and a weight saving of 11,000 pounds. There was no sacrifice of strength or ability to take punishment.

Ready weldability. The trailer is all-welded, and the USS "T-1" Steel retains its superior strength and toughness after welding—at temperatures even down to 50 below zero. Thus, all parts of the body including the drawbar can be welded without loss of strength.

Build better with USS "T-1" Steel. No other steel possesses the remarkable combination of high yield strength (90,000 psi), toughness and weldability found in USS "T-1" Steel. When you also consider the high resistance to impact abrasion, you have a steel that will save money on construction and mining equipment. For more information, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Remember that we also make USS COR-TEN*, USS TRI-TEN* *and* USS MAN-TEN* *Steels . . . standards for heavy-duty equipment.* *Registered trademarks.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Warehouse Distributors
United States Steel Export Company

USS United States Steel

You're looking at the largest forged plate-bending roll ever made

You can never be certain about these things, but we think that the USS Quality Forging in the picture *is* the largest roll ever made for a heavy plate-bending machine. Three of these rolls are arranged in a pyramid, with one alloy steel roll assembled above two carbon steel grooved rolls. A steel plate is rolled back and forth between top and bottom rolls, and the plate is bent as the top roll is tightened down on the bottom two.

As you see it in the 10,000-ton press at our Homestead Forge Shop, the roll is 30″ in diameter and about 60 feet long. You have to use very special techniques to handle a forging of this size during the forging and heat treatment operations

—but the specialists who produce USS Quality Forgings really know how to do it.

After forging, the machining presented some interesting problems. The work surface, or face, of each bottom roll is about 480″ wide, and is tapered from a 30¾″ diameter at the center to 30$^{3}\!/_{16}$″ at the ends. Twelve longitudinal grooves are machined in each bottom roll, equally spaced around the roll body circumference. The grooves are ¼″ wide by $^{5}\!/_{16}$″ deep, and they improve the grip on each steel plate as it is rolled back and forth in the bending machine.

There are only a few places in the world where you can get forgings like this, and United States Steel is the *one* place where you can get that extra bit of skill that distinguishes a USS Quality Forging. And don't forget that in this instance we made the steel, forged, heat-treated and machined it in one plant.

We'll appreciate your inquiries or requests for our free 32-page booklet on USS Quality Forgings. Please write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

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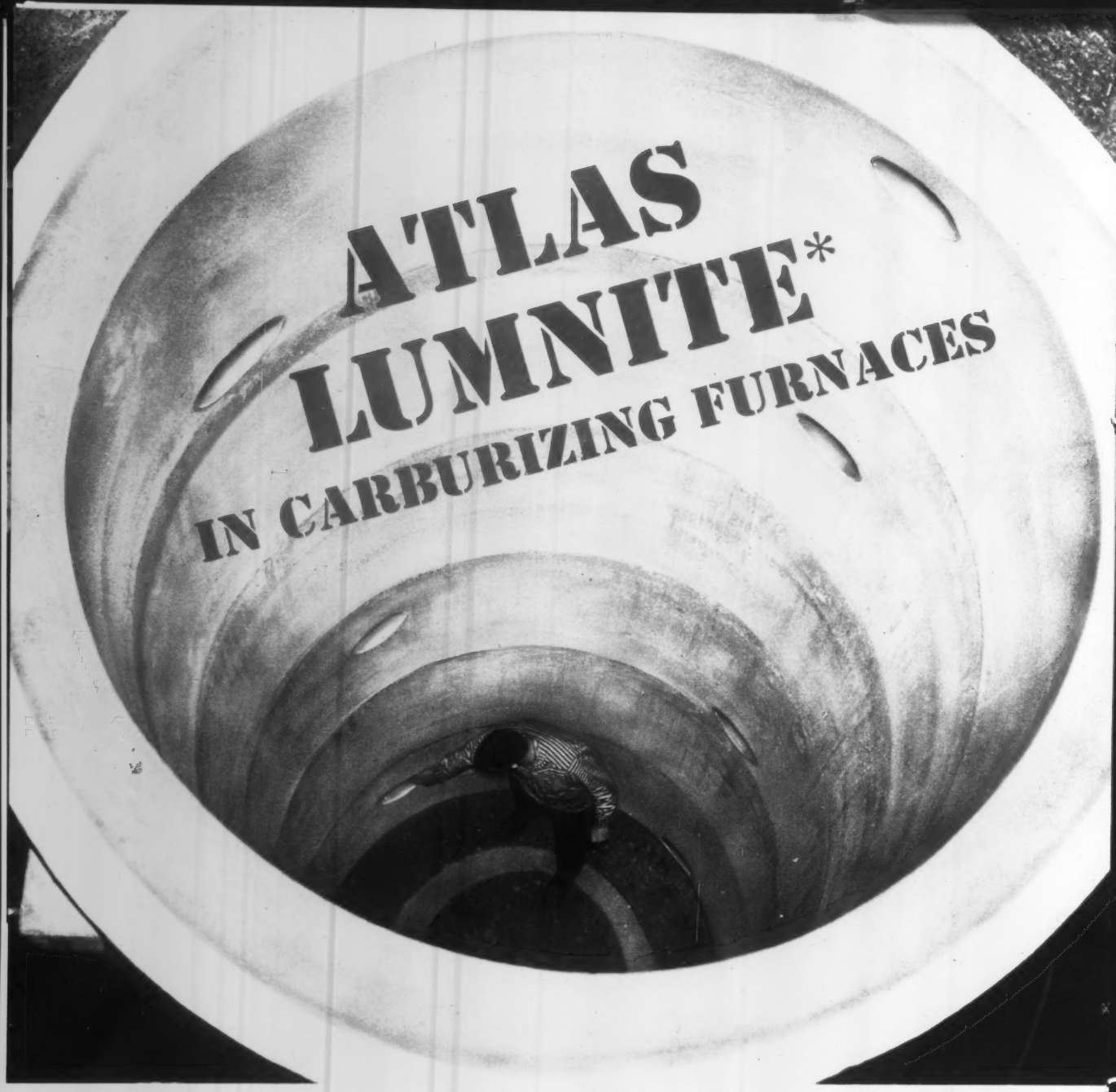
Tennessee Coal & Iron–Fairfield, Alabama
United States Steel Export Company

USS **United States Steel**



Vertical pit-type carburizing furnace (9' x 24') lined with an insulating castable refractory made with LUMNITE cement. Operating temperature to 1800° F. Badall Engineering & Manufacturing Co., Hammond, Ind. Castable used: "Kast-O-Lite," product of A. P. Green Fire Brick Co., Mexico, Mo.

"...withstands thermal shock...reduces heat loss,"

says Fred F. Badalli, Badall Engineering & Manufacturing Co.

- Refractory concrete linings (made with LUMNITE calcium-aluminate cement and selected aggregates) resist furnace temperatures to 2600° F . . . protect against thermal shock due to heating-cooling cycles . . . provide insulation.
- Construction is fast, easy, economical. Linings can be cast in place, troweled or "gunited" . . . service strength is reached in 24 hours.

For maximum convenience, use castables made with LUMNITE cement. These are packaged mixtures, ready for use. Just add water, mix and place. Made and distributed by leading manufacturers of refractories.

For literature on refractory concrete, write:
Universal Atlas, 100 Park Avenue, New York 17, N. Y.

**"LUMNITE" *is the registered trade-mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company*

UNIVERSAL ATLAS CEMENTS

USS TRADE-MARK

L-166

UNIVERSAL ATLAS CEMENT COMPANY—member of the industrial family that serves the nation—**UNITED STATES STEEL**

OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*

ONE TRIP INSTEAD OF THREE

...with world's biggest ladle crane

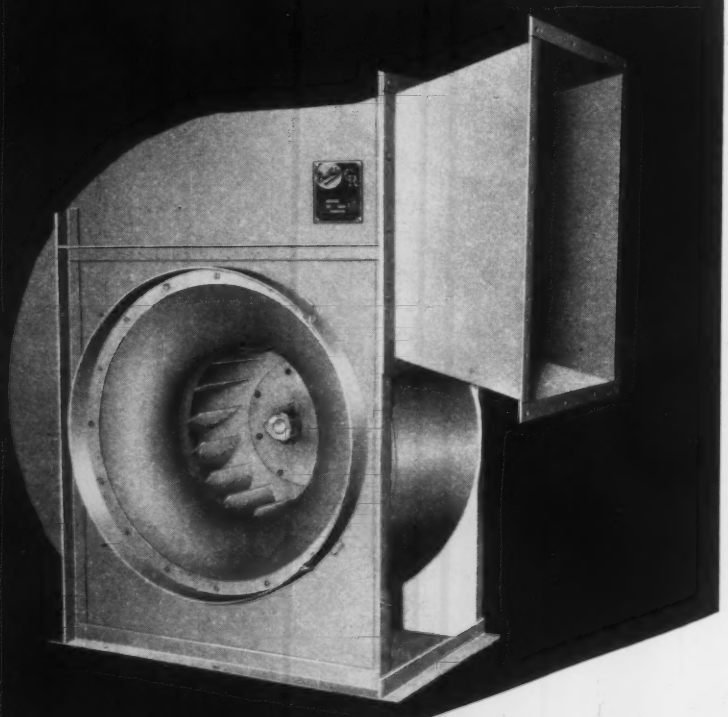
This 500-ton giant, designed and built by Morgan, is doing an important job in stepping up steel-making efficiency. It completes a 375-ton pour in *one trip* from furnace to molds... the 250-ton cranes commonly used in open hearth operations would require *three trips!*

Ninety years of continuous contact with industry's needs and far-sighted engineering research have brought a steady flow of improvements in cranes built by Morgan. Results have been greater speed, capacities and efficiency . . . lower operating and maintenance costs wherever you see the Morgan nameplate.

For any steel-handling operation requiring absolute precision in design and manufacture, Morgan cranes and mill machinery provide the ultimate in profitable, trouble-free performance. Let our representative show you how to speed production and lower costs in *your* mill.

THE
MORGAN
ENGINEERING CO. *Alliance, Ohio*

Overhead electric traveling cranes, gantry cranes, open hearth special cranes, blooming mills, structural mills, shears, saws, auxiliary equipment and welded fabrications



"Buffalo" Type "CR" Radial Blade Fan

DESIGNED FOR PERFORMANCE UNDER DEMANDING CONDITIONS

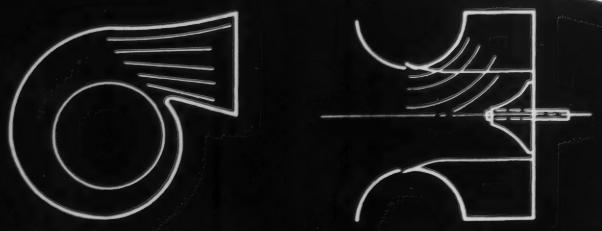
Widely-used in rugged steel mill applications, the "Buffalo" Type "CR" Radial Blade Fan is unsurpassed for dependable and long-lasting service under the most severe industrial conditions.

The "CR" is unique in the fact that the same design principles which reduce wear actually increase the efficiency of these husky fans. An engineering refinement of the radial blade principle — plus a new high in streamlining the entire fan, from inlet through wheel to outlet — boosts performance at the same time that it cuts down wear. (See drawings at left.)

Add to these wear-resistant **design principles** the long-standing "Buffalo" tradition of heavy-duty reliable **construction features**, and you have an unbeatable combination of factors contributing to maximum efficiency and minimum wear.

Investigate this high performance fan, designed for severe industrial service. Ask your nearby "Buffalo" Engineering Representative for full details on the "CR", or write for Bulletin FD-205.

Every "Buffalo" Fan features the famous "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.



Streamlined housing and gradually diverging outlet not only increase static efficiency, but reduce housing wear because of minimum turbulence.

Mating sections of the inlet and wheel flange form a true-half-circle. Resultant smooth air flow further reduces wear and provides peak performance.

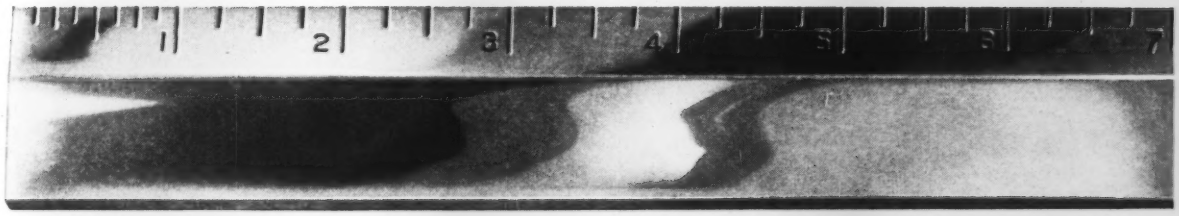
BUFFALO FORGE COMPANY

BUFFALO, N.Y.

Buffalo Pumps Division, Buffalo, N.Y. • Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

There's just One Rule at Bristol Brass...

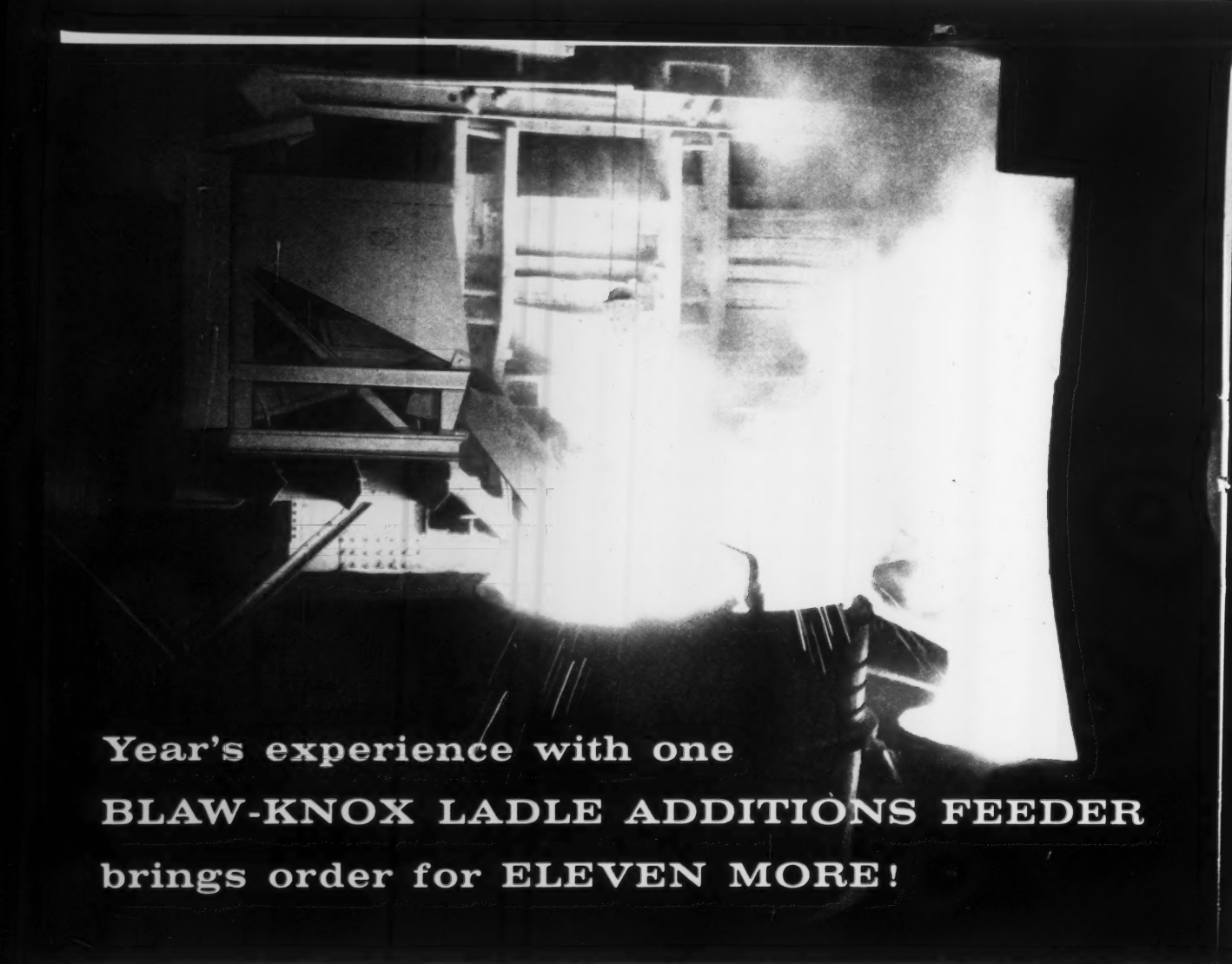


To make every pound of strip, rod and wire the way we would want it, if we were buying it

Bristol-Fashion
means Brass at its best

THE BRISTOL BRASS CORPORATION • SINCE 1850, MAKERS OF BRASS STRIP, ROD AND WIRE IN BRISTOL, CONNECTICUT

Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse.



Year's experience with one BLAW-KNOX LADLE ADDITIONS FEEDER brings order for ELEVEN MORE!

LADLE ADDITIONS FEEDER at Campbell Works eliminates manual feeding of ferro-manganese and controls amount and distribution of manganese to suit individual heat specifications.

. . . Youngstown Sheet & Tube equips entire Campbell Works with new product

After a year's experience with the Blaw-Knox ladle additions feeder, Youngstown Sheet & Tube Company equipped all twelve of their open hearths with Blaw-Knox feeders.

Lower operating costs are made possible with the new ladle additions feeder because more manganese is recovered when additions are made to the ladle rather than the furnace. Control of feed and placement permits a narrower manganese specification and increased economy.

Especially designed to the operating conditions of the open hearth shop in which it will be used, the Blaw-Knox feeder consists of a hopper, self-loading mechanism, electrical vibrating feeder and chute. A self-dumping mechanism is built into the machine to protect against electrical power failure while tapping a heat.

For further information on the Blaw-Knox ladle additions feeder or other steel plant equipment Blaw-Knox engineers are always available to discuss the latest developments in equipment and techniques with you.

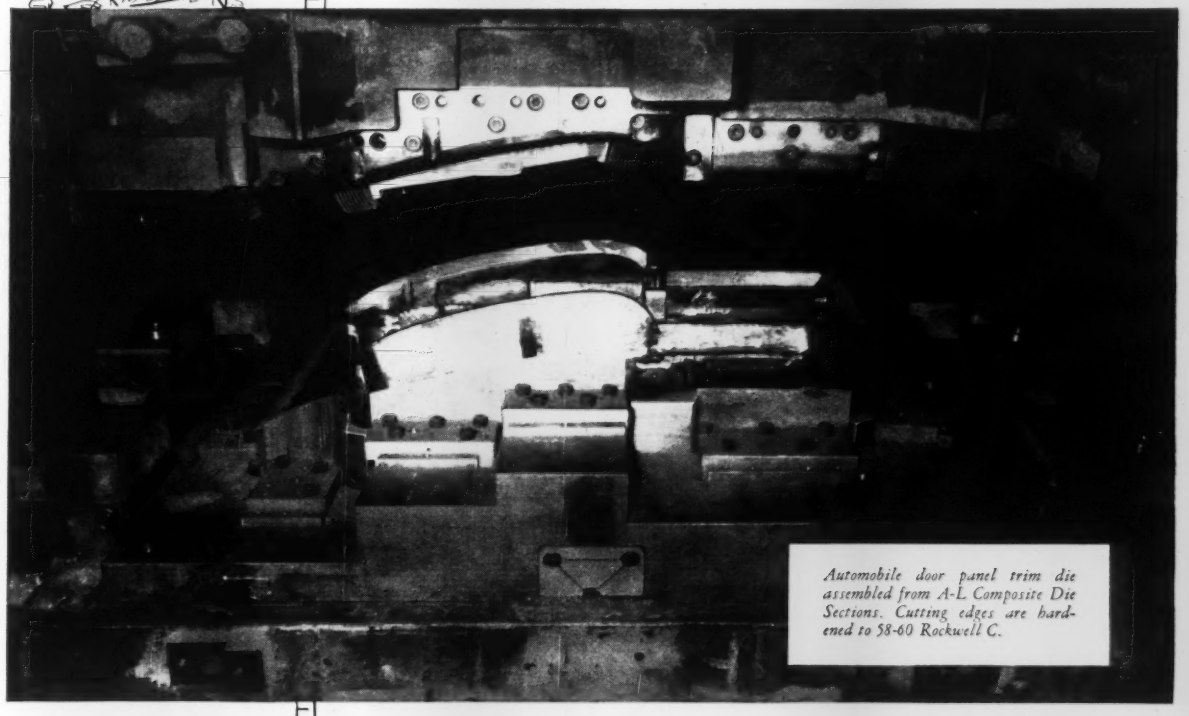
BLAW-KNOX

BLAW-KNOX COMPANY
Blaw-Knox Equipment Division
Pittsburgh 38, Pennsylvania

Why pay the price for CUSTOM-MADE DIES...

when you can easily assemble the shapes you need

from A-L COMPOSITE DIE SECTIONS



Automobile door panel trim die assembled from A-L Composite Die Sections. Cutting edges are hardened to 58-60 Rockwell C.

SEND FOR THIS NEW CATALOG

"FORGING AND CASTING PRODUCTS"

Contains the latest information on FCC Air Hardening, Oil Hardening and other Cast-To-Shape Tool Steel Specialties that can save you time and money . . . also Composite Die Sections and Smooth Hammered Forgings in a wide range of tool and stainless steels. *Don't wait—get your copy NOW.*

Write Today

ADDRESS DEPT. S-3B

Dies can be assembled from A-L Composite Die Sections to blank, trim, bead or do any job requiring the cutting of sheet metal to regular or irregular shapes. Thousands of die shapes are possible from combinations of the thirty-five standard sections carried in stock. Thus, you save the time and trouble of machining custom-made sections from solid stock and minimize the waste of valuable tool steel.

These standard sections . . . made in a variety of water hardening tool steel grades . . . are electrically butt welded by a special process to non-hardenable mild steel bases. Because the base always remains soft, screw and dowel holes are easily drilled after the tool steel edges have been machined and heat treated.

Ask your Allegheny Ludlum representative about this money-saving method of die making . . . or write *Allegheny Ludlum Steel Corporation, Forging and Casting Division, Wanda and Jarvis Aves., Detroit 20, Mich.*

For complete MODERN Tooling, call

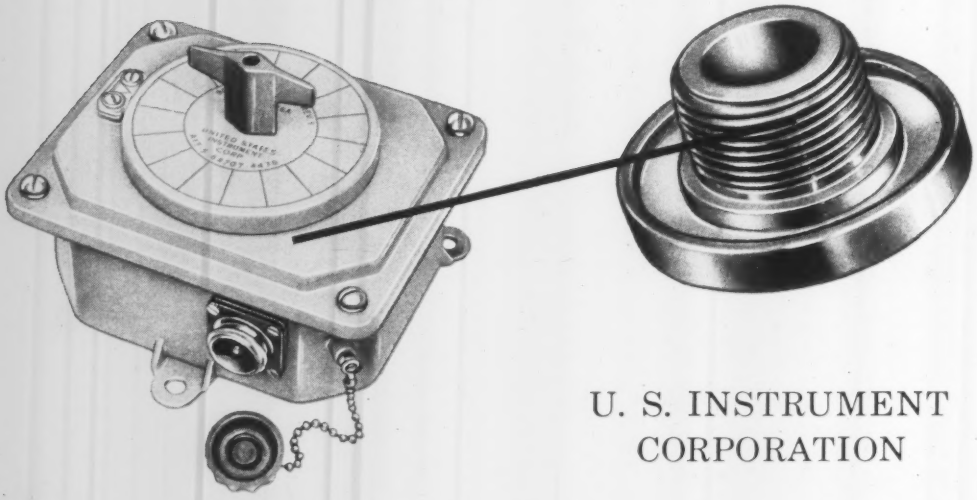
Allegheny Ludlum

AL® FINE TOOL STEELS SINCE 1854

WSW 6079

Three more nationally known manufacturers select Mueller Brass Co. Forgeable Bearing Alloys for vital components of their products

In ever-increasing numbers, Mueller Brass Co. specialized alloys are being specified by manufacturers of top-quality products. In a series of continuing advertisements, we have presented case histories of successful applications, to which we now add three more distinguished companies who are incorporating Mueller Brass Co. forgeable bearing alloys in their products to meet the demands of widely divergent operating conditions.



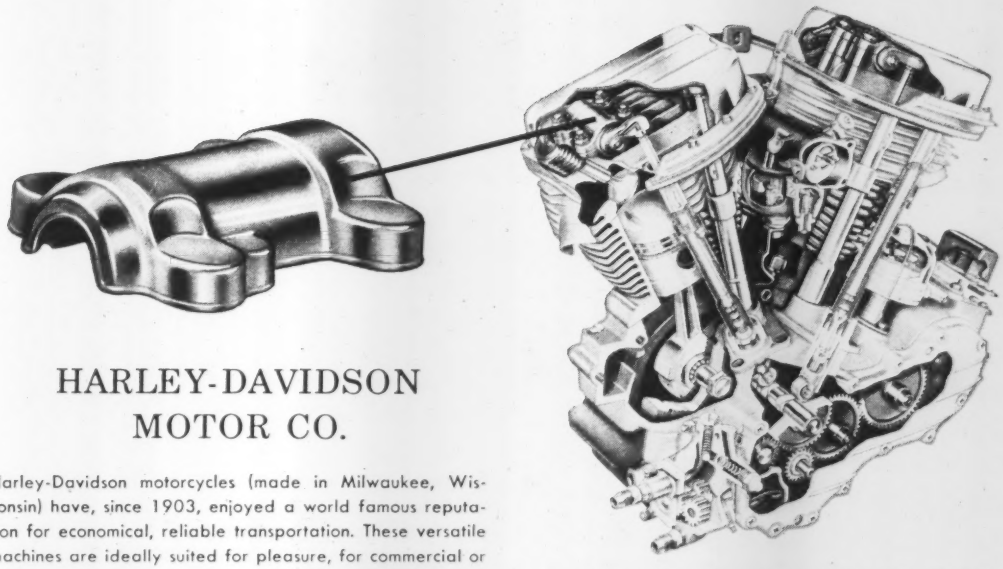
U. S. INSTRUMENT CORPORATION

U. S. Instrument Corporation, Charlottesville, Va., selected abrasive-resistant Mueller bronze alloy bushings for their remarkable telephone selector switches after exhaustive tests of many materials. A vital communications link on today's U. S. Naval vessels, these sound-powered telephone circuits must meet rigid Navy performance-standards. Such phones, for example, must have selector switches which are capable of rotating for a minimum of 50,000 torturous cycles . . . 360° clockwise, followed by 360° counter-clockwise. In addition, the "O" ring must still form a water-tight seal AT THE END OF THE TEST! Of the many tested, a Mueller Brass Co. special manganese bronze alloy was the best one meeting these rigid specifications.

There were other important reasons why these bushings were chosen by U. S. Instrument Corporation for this application. Resistance to abrasive action against the rubber "O" ring was a prime one . . . then, too, the stem assembly suffered severe pounding through the action of the indexing mechanism which, prior to the use of the Mueller Brass Co. alloy, caused repeated seizure of the component parts. In this particular application, the part was fabricated on an automatic screw machine rather than produced as a forging. The versatility of Mueller Brass Co. alloys makes them readily adaptable to the most economical method of fabrication dependent upon the size, shape, and end-use requirements of the part.

In commenting on the success of this part, U. S. Instrument Corporation praised the alloy for its tensile strength (ordinary brasses could not withstand the 2000 ft. lb. impacts without deformation), for its machinability and corrosion-resistance.

MUELLER BRASS CO.



HARLEY-DAVIDSON MOTOR CO.

Harley-Davidson motorcycles (made in Milwaukee, Wisconsin) have, since 1903, enjoyed a world famous reputation for economical, reliable transportation. These versatile machines are ideally suited for pleasure, for commercial or business use, as well as the grueling demands of law enforcement work. Harley-Davidsons boast a dependable engine . . . one which can roll up an astounding mileage record with little or no care. The painstaking selection of every engine component is one important reason for this reliability. The new twin-cylinder Harley-Davidson 74 OHV employs Mueller Brass Co. bronze alloy forgings in the form of rocker-arm bearing caps. Subjected to violent temperature changes, fast starts and stops and road shock, Mueller forgings are proving again and again that they have the ability necessary to withstand almost any punishment . . . and still provide unfailing service.

JACOBSEN MFG. CO.

Jacobsen Mfg. Co., Racine, Wisconsin, was among the first to produce a practical power mower for home use. That was more than 35 years ago! Today, Jacobsen power-mower dependability is evident itself in more than a dozen gleaming new models such as the popular Pacer, Lawn Queen, Manor and others. One of the most reliable components in the always dependable Jacobsen hi-torque engine is a Mueller Brass Co. connecting rod forged from special bronze alloy. Jacobsen mowers with Mueller-forged connecting rods are called upon by some commercial users to operate as much as 8 hours daily, 6 days a week . . . perhaps as much as 2000 hours a year. In searing summer temperatures, thru hours of constant operation, the high uniform strength of Mueller bronze forgings constantly withstands pounding and vibration with the same conspicuous success as in its many other applications.

Why not investigate these specialized alloys for your own products. We welcome your inquiries. Our engineering staff will be happy to make specific recommendations. Both on the proper alloy and the best method of fabrication to meet your needs . . . exactly. Our engineering manuals show many, many examples of how American manufacturers have used these alloys to great advantage.

• WRITE TODAY FOR THE ENGINEERING MANUAL YOU NEED

Mueller Brass Co. Forgings
Engineering Manual H-58565 ☐

Tuf Stuf Aluminum Bronze Alloys
Engineering Manual H-58563 ☐

"600" Series Bearing Alloys
Engineering Manual FM-3000 ☐

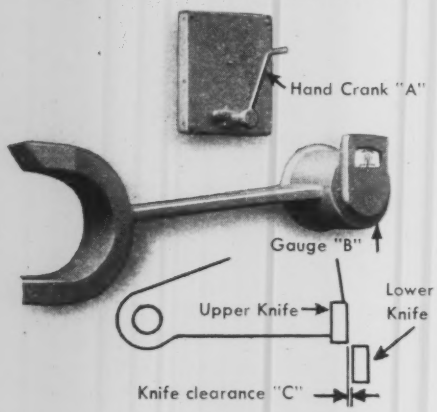
Copper Base Alloys in Rod Form
Engineering Manual FM-3010 ☐

227

P O R T H U R O N 2 6 , M I C H I G A N

SET KNIFE CLEARANCE AT 8% OF METAL THICKNESS

HOW KNIFE CLEARANCE IS ADJUSTED ON STEELWELD SHEARS



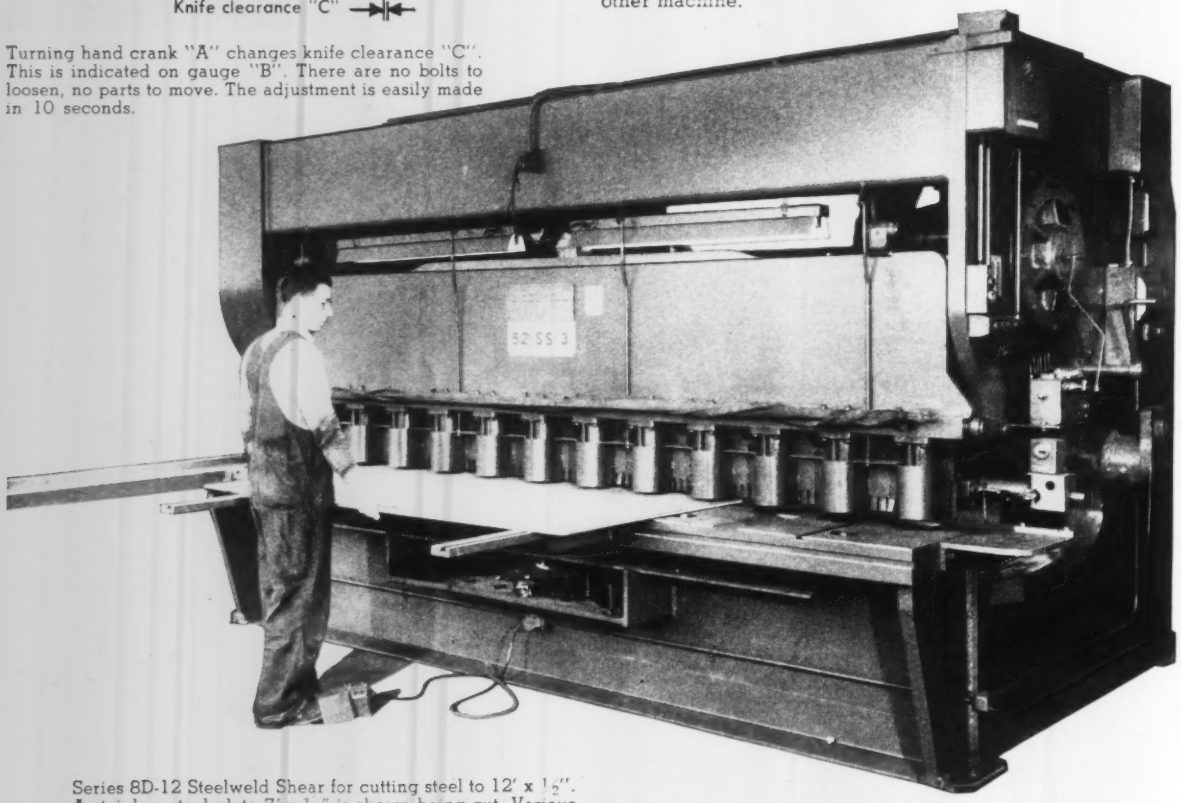
Turning hand crank "A" changes knife clearance "C". This is indicated on gauge "B". There are no bolts to loosen, no parts to move. The adjustment is easily made in 10 seconds.

8% is a good figure to remember when shearing mild steel. By adjusting the clearance between the knives to 8% of the thickness of steel being cut, you will get the best cuts and the knives will stay sharp longer.

Because of the importance of having the right knife clearance for every shearing job, Steelweld Shears were designed to make this adjustment extremely easy. In fact, it can be made in 10 seconds. Consequently, it becomes a natural routine part of a shear operator's job.

You will find this feature invaluable if you shear various thicknesses. It eliminates the need of working with some fixed compromise knife clearance setting with resultant cuts that vary from the ideal more or less as the knife adjustment is off from the correct setting.

Steelweld Shears are the most modern on the market today with more features that make for speed, accuracy and long trouble-free operation. Some of their fine features are not obtainable in any other machine.



Series 8D-12 Steelweld Shear for cutting steel to 12' x $\frac{1}{2}$". A stainless steel plate 7' x $\frac{3}{8}$" is shown being cut. Various thickness plates, as well as heavy steel grating, are also cut on this machine, which is in a West Coast plant. Knives on this hard-working shear last 3 to 6 months before they need to be turned to another cutting edge.

Write for free copy of Catalog No. 2011
Gives construction and engineering details

STEELWELD

PIVOTED BLADE **SHEARS**

STEELWELD DIVISION · THE CLEVELAND CRANE & ENGINEERING CO. · 7854 E. 282 ST. · WICKLIFFE, OHIO

Are You Getting What You Pay For?

When you pay for HIGH QUALITY high-carbon wire, you want to be sure you get it. You do, when it is supplied by Roebling.

It is unsurpassed in quality, consistently true to specifications, and absolutely uniform in gauge. Hundreds of manufacturers attest to this fact . . . the qualities that they *pay* for—they *get* in Roebling high-carbon wire. The length of our relationship with customers proves it.

We'll be glad to show you what we mean. For information on superior high-carbon wire or cold rolled strip, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

This lightweight "No Charge" spool is typical of Roebling's modern packaging methods that save customers time and money.

ROEBLING

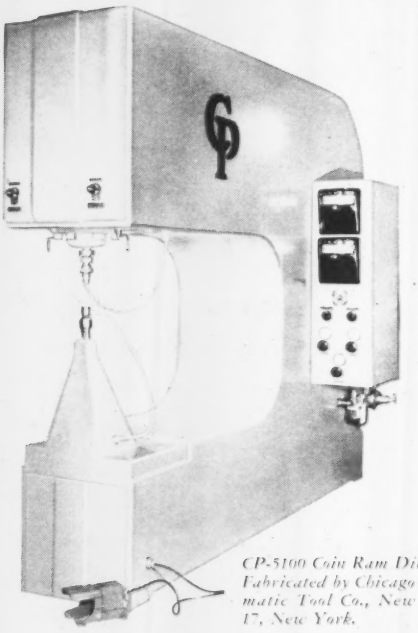
Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

Weldynamics

ARC WELDING AT WORK CUTTING COSTS

How cost is reduced 37% ...weight cut 61% by Weldynamics



CP-5100 Coin Ram Dimpler. Fabricated by Chicago Pneumatic Tool Co., New York 17, New York.

Here's how Weldynamics has solved the problem of rigidity, accuracy and cost for a machine builder. With welded steel design the weight was cut from 18,000 pounds to 7,000 pounds *while holding alignment accuracy to .003"*. The cost was reduced from $2700 for a casting to $1700 for the weldment.

Weldynamics saves money because steel is 3 times as strong, 2½ times as rigid and costs a third as much per pound as cast iron.

How to put WELDYNAMICS to work for you

Lincoln field engineers, trained in Weldynamics, will help you design lower costs into your products. They stand ready to advise and recommend on procedures, equipment and electrodes to cut your welding costs.

New, 11th edition, "Procedure Handbook of Arc Welding Design and Practice" has 1300 pages, 1100 illustrations, 260 pages on machine design. $3.00 in U.S.A., $3.50 elsewhere.

Machine Design sheets published regularly give tips on welded design. No charge to Design Engineers and Production Supervisors. Just write us.

The World's Largest Manufacturer of Arc Welding Equipment

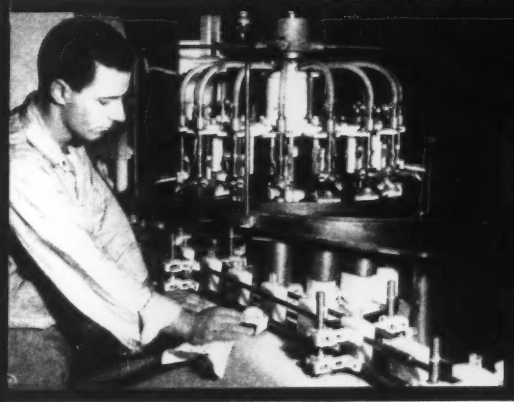
LINCOLN

© 1958 The Lincoln Electric Company

THE LINCOLN ELECTRIC COMPANY, DEPT. 1638, CLEVELAND, OHIO

people buy Scott Wipers for many reasons:

Mr. Arthur Schute (right), Plant Manager at Revlon, says: "Scott Wipers are soft and absorbent, yet strong. We use them on production lines, filling lines, for cleaning ink from coding machines, for wiping oil and grease, and of course our employees use them for wiping hands and face."



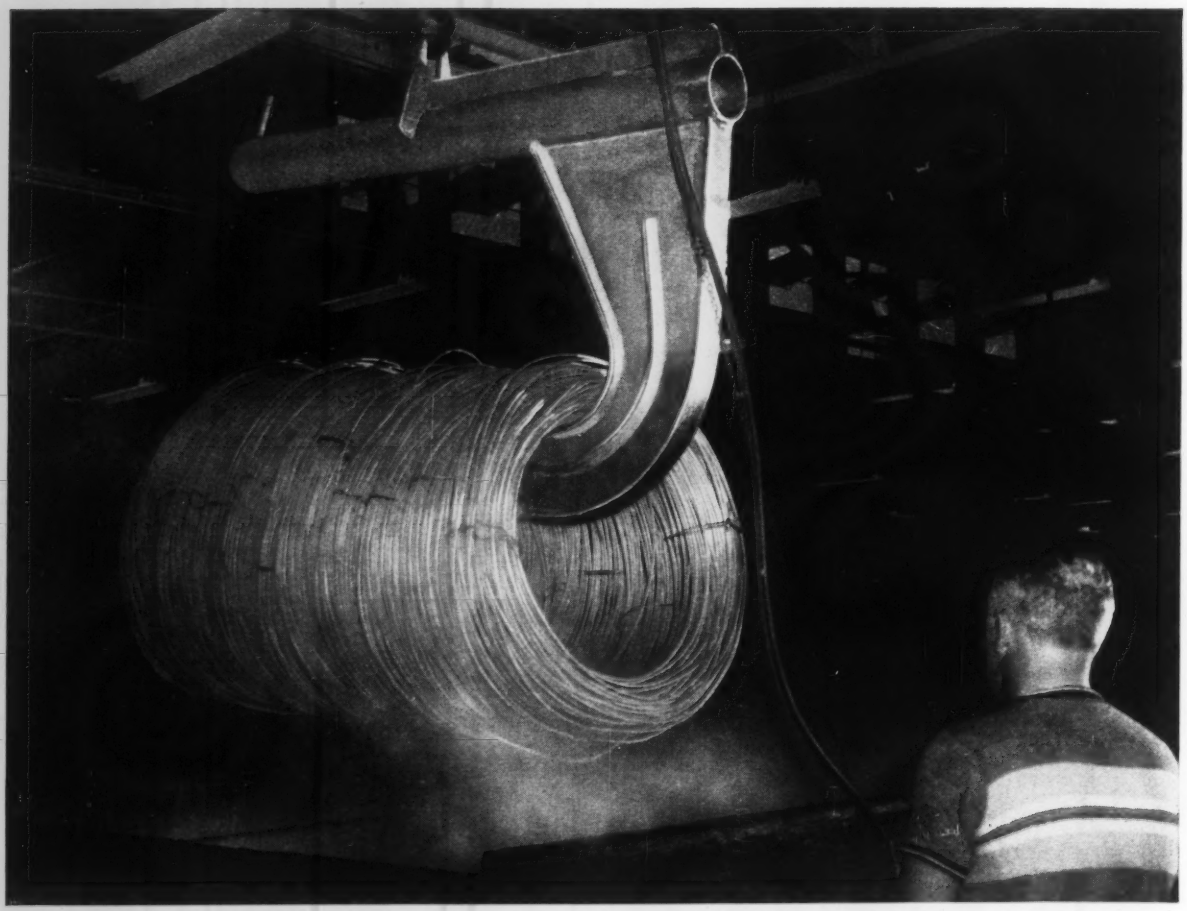
Revlon saves $4,000 annually with Scott Wipers!

Revlon, Inc., at Passaic, N. J. has used Scott Wipers for about 15 months . . . for personal wiping, equipment wiping and miscellaneous clean-ups. Benefits: a high degree of sanitation in packaging operations and overall savings of $4,000 annually in wiping costs. Scott Wipers have eliminated the costs of cloth wiper distribution, collecting, sorting and laundering . . . are merely issued, used and tossed into handy receptacles.

SCOTT PAPER

Get the complete Revlon case history, with cost figures, from your Scott distributor. He's in the Yellow Pages under "Paper Towels." Or write: Scott Paper Company, Dept. S-83, Chester, Pa.

Makers of the famous Scott paper products you use in your home. See "Father Knows Best" and "The Gisele MacKenzie Show" on NBC-TV.



Short ton or a long ton. No need to be fussy about loading pickling equipment made of Monel alloy. It *stays* strong. And it's easy to fabricate in heavy structures like this pickling hook. Hook was designed and built by Youngstown Welding and Engineering, Youngstown, Ohio for Triangle Conduit and Cable Company.

After 8 years on the pickling line... this Monel hook is solid all the way through

There's certainty about the strength of a Monel* nickel-copper alloy pickling hook.

Take the Monel hook above. It's just as solid as it looks... all the way through. In fact, in this plant a Monel hook has given over eight years of continuous service in 6% sulfuric acid at 140° F. Only minor repairs.

What makes Monel pickling hooks different?

Monel alloy provides a unique combination of strength and resistance to corrosive attack from sulfuric acid pickling solutions. It's the strongest non-ferrous metal you can use for pickling. And it outlasts other materials many times over.

Because Monel alloy is strong, you can have pickling hooks that are lighter, carry greater loads with less deadweight. No need to allow extra metal to offset corrosion. And here's another saving: you can easily repair Monel alloy equipment after years of service.

Monel alloy is a natural for other pickling equipment, too

Monel slings, chains and tie rods are low in deadweight, tops in corrosion resistance and strength. And in fabricated equipment like baskets, crates and racks, Monel alloy's workability and easy welding properties really pay off. You'll find details about Monel pickling equipment in a 32-page illustrated booklet "Equipping the Pickle House for Greater Production at Lower Cost." For your copy, just write Inco.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street INCO New York 5, N. Y.

INCO NICKEL ALLOYS

Metalworking Outlook

Why Does the Price Index Rise?

Why does the consumer price index go up during a recession? Because there's only an "indirect and somewhat remote" link between current business conditions and the index which set another record in February, explains Ewan Clague, head of the Bureau of Labor Statistics—it compiles the price data. The services category makes up about one-third of the total index, and it moves sluggishly—behind general business conditions. Food prices, another major part of the whole index, have been rising because of the freezing weather in the South. "If the present downturn lasts long enough, the index will be affected," says Mr. Clague, "but I don't see much change for it on the downside in the next few months."

Second Thoughts on Capital Outlay Dip

Capital outlay declines may be even more serious than first thought. The drop from $37 billion spent in '57 to the $32 billion expected to be spent in '58 is bad enough, but a Commerce Department breakdown of manufacturing and utility expectations shows: 1. The drop in projects to be started this year (in contrast to those carried over from '57) is much greater than the dip in anticipated total spending. 2. The backlog of spending to be carried over into '59 will be much lower than that carried over into '58, even assuming no projects get canceled in '58. 3. Despite the drop in new projects, half the anticipated spending this year will be on new projects that can be more easily canceled than jobs underway.

Big Three To Spend $1.5 Billion on '59 Models

The Big Three automakers expect to spend $1.5 billion getting '59 models ready for production. That's about the same as the cost for '58 model introductions. Despite the indifferent sales performance for many of this year's cars, the '59 entries will debut at about the same time as usual—in October and November.

Recession Tones Labor Down

No major innovations, either in contract negotiations or in legislation, are likely on the labor front this year, believe B. W. Hale, director of employee relations for New Jersey Zinc Co.; Virgil Day, manager of union relations for General Electric Co.; and Gordon I. Thayer, director of industrial relations for Vitro Corp. of America. They told an American Management Association conference that the recession will tone down contract negotiations and that preoccupation with defense and recession matters will keep labor legislation at a minimum this year.

Major New Labor Law Unlikely in '58

The McClellan Committee report recommends laws to: Regulate and control pension, health, and welfare funds; regulate union funds; insure union democracy; curb activities of "middlemen" in labor-management disputes; and

clarify a no-man's-land in labor-management relations where neither the National Labor Relations Board nor a comparable state agency has jurisdiction. Besides being involved with defense and recession matters, Congress will do little about the recommendations in '58 because this is an election year.

Steelworkers Aim at Valve, Pump Makers

United Steelworkers is laying the groundwork for a big drive next year in the valve and fitting and pump and compressor industries. The steel union has 118 locals in those industries, representing 51,646 workers. Contracts covering 23,198 workers in 55 locals expire this year, and the remainder run out in '59. One of the first USW moves will be to get as many as possible of the contracts to expire at the same time, a hoary device that enables the union to strike all firms at once. The general objective is to apply the basic steel pay and fringe levels to the industries. The union claims that wages and benefits in valves, fittings, pumps, and compressors run 80 cents to $1 per hour behind those in basic steel.

Short Week To Come Naturally?

Look for the short week to return as a labor demand in the future, although it's a dormant issue now. The less-than-40-hour week may even come gradually without a union demand. In Chicago, 10 per cent of all manufacturing workers have standard workweeks under 40 hours. Among all office workers, 38 per cent work less than 40-hour standard weeks.

Electronics in the West

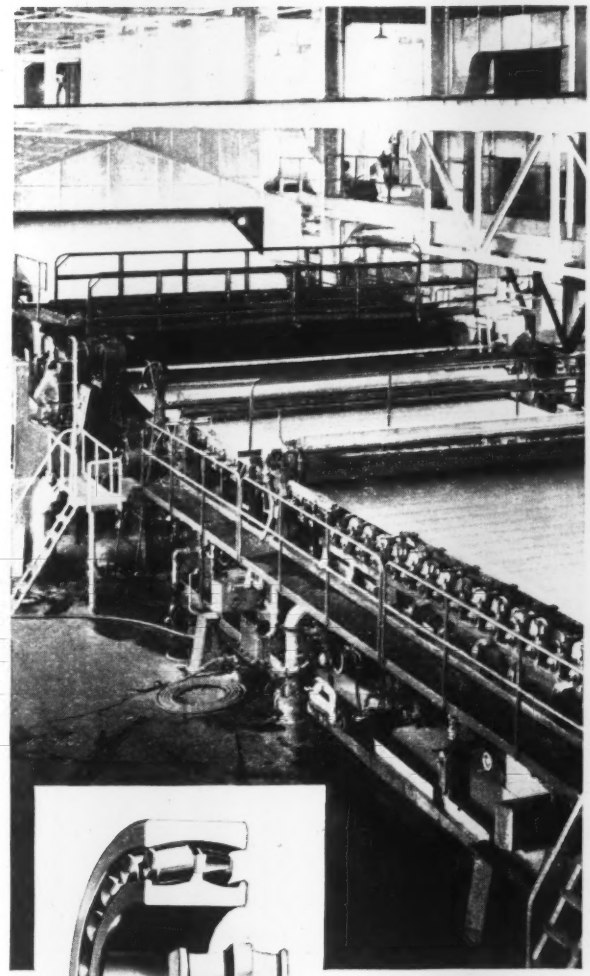
Electronics now ranks as the fourth largest manufacturing activity in the West, topped only by transportation, food processing, and lumber. Last year, 664 western companies produced $1.8 billion worth of electronic equipment, nearly 24 per cent of the national total. Employment is 123,000.

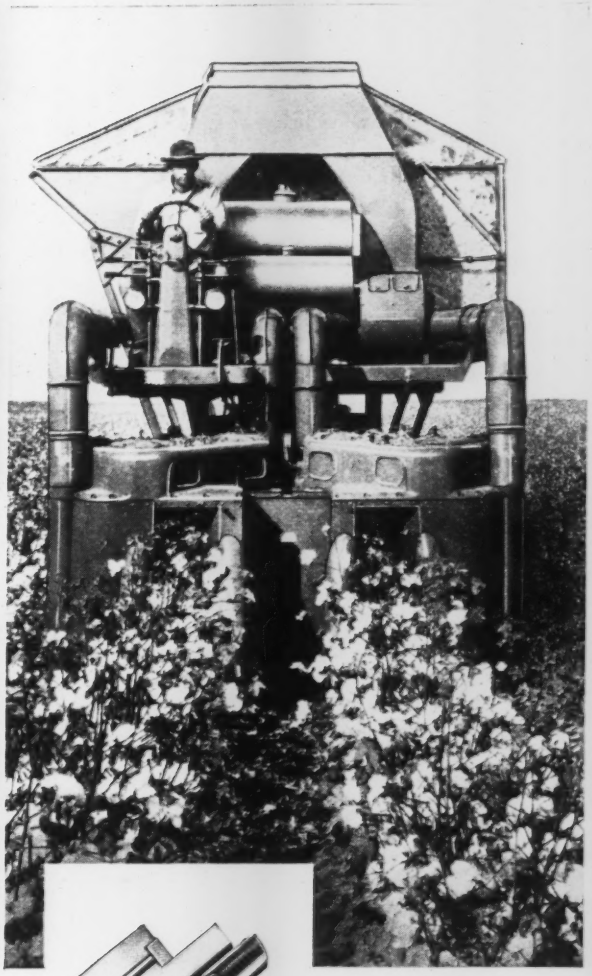
Marketing: Sign of the Times

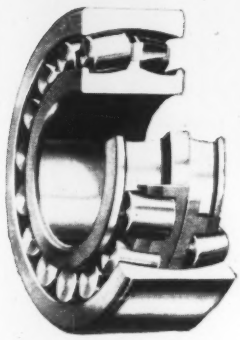
The National Industrial Advertisers Association proposes to convert itself from an industrial advertising group to an industrial marketing association. If the plan is O.K.'d by members at a June 3 meeting, NIAA would change its name to International Society for Industrial Marketing and would be operative by July 1, 1959. Membership would be on a company basis for those engaged in marketing industrial products and services.

Straws in the Wind

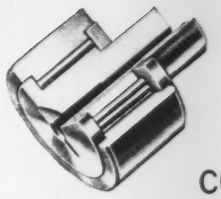
General Fireproofing Co.'s new line of office furniture features aluminum units anodized in two tones . . . Farm implement dealers in the Southwest are having their best spring business in five or six years . . . An iron ore deposit has been discovered at Lake Normand, 120 miles northeast of Montreal in Quebec.







from
paper mills...



to
cotton pickers

Torrington makes the right anti-friction bearing for every basic need!

It may be self-aligning Spherical Roller Bearings in a paper machine producing record tonnages. Or compact, high-capacity Cam Follower Needle Bearings activating the intricate mechanical fingers that take the back-breaking work out of cotton picking.

Between these two examples lie all kinds of requirements. To meet the broad range of needs, Torrington makes every basic type of anti-friction bearings.

This wide range of experience enables you to rely on Torrington for engineering recommendations based on your specific application requirements. Your Torrington representative has valuable experience—rely on him for assistance. **The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.**

design engineering show 1958

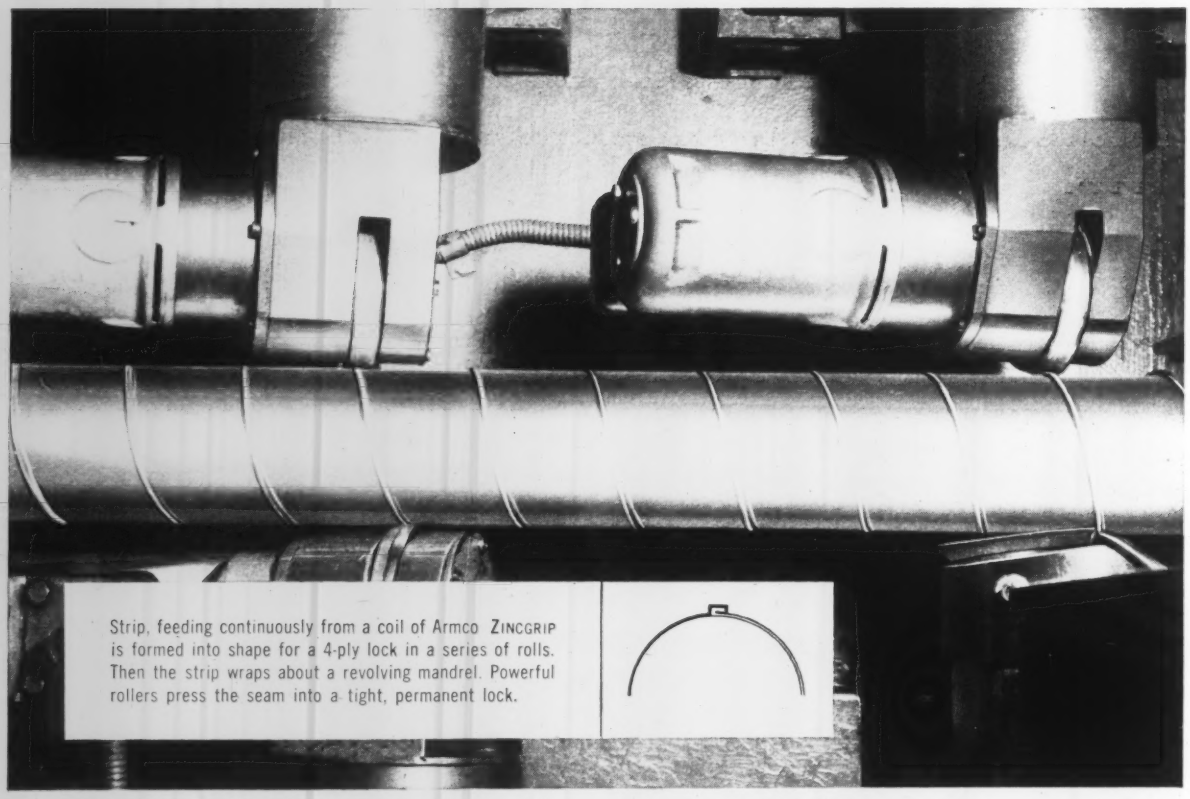
TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

in this continuous lockseaming operation . . .

Zinc coating on Armco ZINCGRIP Steel doesn't flake or peel



Strip, feeding continuously from a coil of Armco ZINCGRIP is formed into shape for a 4-ply lock in a series of rolls. Then the strip wraps about a revolving mandrel. Powerful rollers press the seam into a tight, permanent lock.

Here's in-shop evidence that the zinc coating on Armco ZINCGRIP® Steel clings tightly during severe fabrication.

This machine forms sheet metal into conduit with a continuous spiral lockseam. Few fabricating operations could provide so severe a test for a zinc-coated steel. But Armco ZINCGRIP Steel meets every requirement. Its special hot-dip zinc coating doesn't flake or peel.

This complete zinc protection is doubly important for the conduit. It not only wards off rust when exposed on construction sites, but resists corrosion in areas within buildings where maintenance is difficult or impossible.

If your products require drawing, forming, lockseaming, or any other severe fabrication, you can rely on Armco ZINCGRIP. Just fill in and mail the coupon for full information about this workable, zinc-protected steel.

Other Armco Steels for top-quality products include ZINCGRIP PAINTGRIP®, Stainless Steels, ALUMINIZED STEEL, Cold-Rolled PAINTGRIP, Enameling Iron, Steel Tubing, Electrical Steels, High Strength Steels, Long Ternes, and high-quality Hot- and Cold-Rolled Sheets.

ARMCO STEEL CORPORATION
1348 Curtis Street, Middletown, Ohio

SEND complete information about Armco ZINCGRIP.

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

ARMCO STEEL

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SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

No Time To Read?

We have just read an excellent criticism of the American educational system. It contrasts the frivolities of U. S. teaching methods with the austerities of the Russian system. It warns that courageous action must be taken if we are to win the battle of future brainpower.

We agree. And we suspect we are joined in our opinion by most of our readers who have read or listened to scores of similar criticisms.

But we wonder if it isn't time to give the upcoming generations a respite and turn a critical eye on the quality of the information possessed by the present generation—the one that is running our country and our industry. Its lease on the driver's seat still has many years to run.

We realize that most adults would have a tough time keeping abreast of all the technological developments of this age. Many become obsolete even before the specialists have time to read the literature on them.

But what about our own fields?

Do we know what productive equipment will give us the lowest possible unit costs?

Do we really understand our marketing problem? Do we know why buyers of industrial goods buy what they buy? Do we know who really influences such purchases? Do we comprehend the modern marketing function and organization?

Is our purchasing function simply one of buying established products under the most favorable conditions we can obtain? Do our buyers really know how to find equal or better values at lower cost? Do we actually know when it is smarter to make than buy and vice versa?

Are we conversant with the new management techniques? Do our organizations reflect them?

If we have to answer any of those questions in the negative, we have a problem.

Time and time again we have heard industrial executives explain: "I don't have time to read all the stuff I should." We sympathize. Quite honestly, we feel that way, too.

But until we fully understand the problems in our own fields, the "no time to read" excuse is just as flimsy as those made for the laxity in our school system. We can hardly criticize our undergraduate educational system until we have put our own information in order.

Selective reading is the quickest and most effective answer. The information is available. Selectivity is the key.

You don't have time to read?

You can't afford not to.

Walter J Campbell

EDITOR

and now it's....

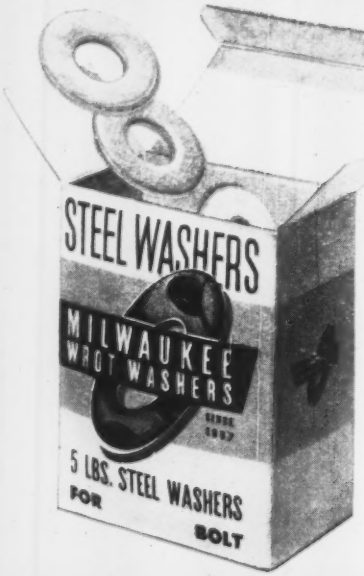
WASHED WASHERS

● Whether *dispensing* or *using* washers . . . there's great personal satisfaction in handling clean washers that don't mess up your hands nor soil the "work".

Yes, *washed washers* are the latest practical innovation introduced by Wrought Washer Mfg. Company, applying to all popular sizes of U. S. Standard and SAE Washers, including also Rivet Burrs and Machinery Bushings. All grease, graphite, oil and other foreign matter is removed by our special washing process. This is a new *plus value* over and above the consistent high quality which is an inherent part of all Milwaukee Wrot Washers . . . *at no increase in price!*

No matter what your washer requirements may be . . . every type, size, material and finish . . . look to Wrot Washer as your No. 1 source. Write for Catalog No. 40.

DEALERS: Order from your regular jobber . . . 1-lb. and 5-lb. packages, put up in 200 lb. shipping cartons.



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In keeping with a policy of "dressing up" the washers themselves, by our special washing process, they are now put up in attractive 1-lb. and 5-lb. packages with a tough, transparent Mylar window which makes visible the actual washers . . . *clean to handle, better to use.*

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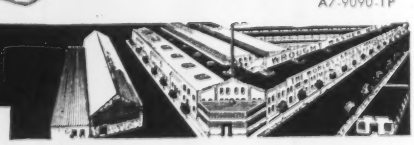
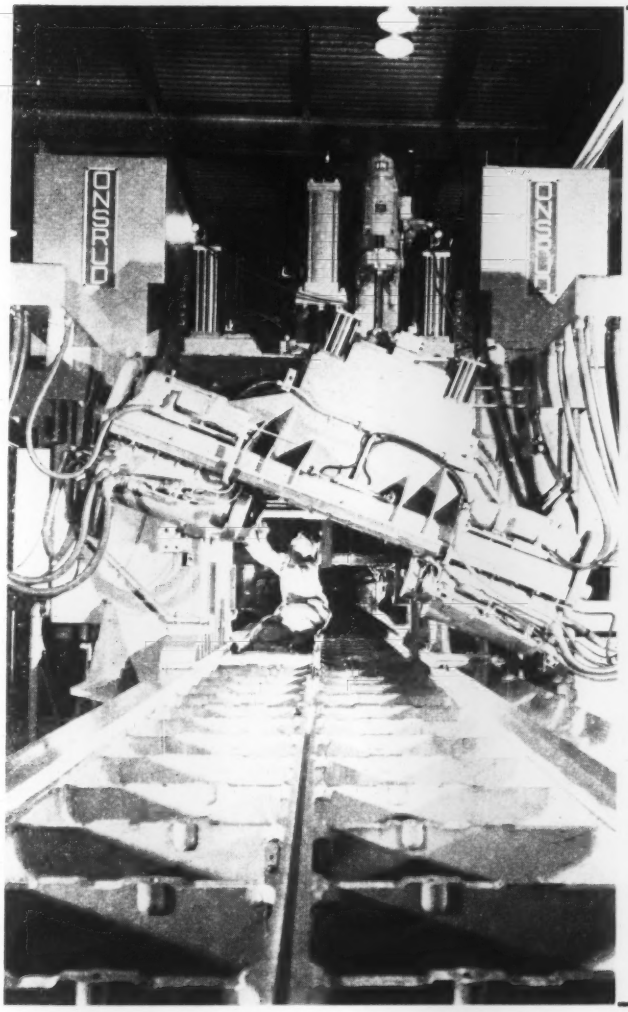




Equipment Makers See End of Dip

Construction Equipment—Heavy inventories produced in anticipation of the road building boom are still a problem. The potential is there; it's a matter of timing.

Foundry Equipment—A wait-and-see attitude characterizes this industry. Inquiries have picked up, but orders are down.

Heavy Electrical Equipment, Controls—Orders are not as high as they were a year ago—especially for controls. But backlogs are sufficient to carry most plants through 1958. Foreign demand is holding up well.

Industrial Furnaces—Orders are up slightly since the first of the year, but they still lag behind the 1957 pace. At least three substantial orders were placed in March.

Machine Tools—Orders are edging up, but they are nothing to shout about. Backlogs are low but steady as producers cut back on shipments to match orders.

Material Handling Equipment—Orders are edging up, and inquiries indicate the trend will continue. Re-equipment is the big sales pitch of this industry.

Mining Equipment—The downturn has bottomed out, but except for special machinery, no upturn is evident.

Steel Mill Equipment—Orders are steady; shipments are good; and backlogs are high. One reason: Good foreign demand.

Welding Equipment—Orders for resistance welding machines have turned up slightly since Jan. 1 but are still low. By comparison, arcwelding equipment sales are up a little more.

Capital Goods Level Off

MANUFACTURERS of capital goods have plumbed the depths of this recession, but they can't see an upturn of any significance until the second half. Many are turning to the modernization market to tide them over until the next period of expansion sets in.

The capital goods people are by no means unanimous in their appraisal of the current business situation or in their opinions on what to do about it. Those with strong overseas connections are generally doing better than those without them. Some feel that the cost of heavy equipment is so high that price cuts become minor, so they are holding the line. Others are paring quotations to the bone to land sales. But with few exceptions, most agree that they will have to concentrate on the modernization market.

Pro and Con—One of the exceptions—a producer of steel mill equipment—declares: "You just don't go out and solicit business for heavy capital equipment. The board of directors periodically reviews its costs. If it decides some equipment is inefficient, it may decide to replace it and invite bids from producers. That's where competition steps in."

In reply, another sales vice president says: "Our men have to get into the plants to see what equipment we can replace at savings in over-all costs. We can't wait for a board many times removed from the production picture to decide it's time to move."

It Works—"There is a definite need for replacing equipment," says

Re-equipment: Main Avenue to Cost Reduction

THE CURRENT recession presents a remarkable opportunity for the sellers of cost-reducing and quality-improvement equipment, says Alfred V. Bodine, president of the National Machine Tool Builders' Association and the Bodine Corp., Bridgeport, Conn.

"The typical company making a product for general use finds its volume down and competition up. It must cut costs. Three avenues offer little, if any, opportunity to do so: Taxes, wages, materials. The one main avenue of cost-reduction open today is modernization.

"Only through the replacement of old machines by new ones with greater output per manhour can America's metalworking companies work their way out of the cost-price squeeze.

"The fact is that an amazingly large share of the machine tools (and other equipment) now on plant floors is obsolete. Today, when even pennies are important, machine tool builders can talk to customers in terms of thousands of dollars to be saved by throwing out these old machines and installing new ones that multiply productivity."

Robert E. Fleming, executive vice president of the Industrial Heating Equipment Association Inc. "But it is something else for a company to have the guts to go ahead with a purchase." Many of the companies report to STEEL that they are having success when they can show a customer in dollars and cents where he can beat the cost squeeze by installing new equipment now. "This hard sell is not as easy as taking orders was a year or so ago," says one executive, "but it's the only thing that works today."

Here's a rundown on how segments of the industry are doing:

Construction Machinery — Sales are running well below those of a year ago, but the industry is just entering its best selling season. Bad weather has postponed some sales, officials believe, but they feel this is temporary. Caterpillar Tractor Co. is going back to a five-day week today after working only four days a week since January. Clark Equipment Co. has rehired all those laid off since last summer. Says Clarence Killebrew, vice president: "We expect to make up for our 12 per cent dip in the first quarter during the second period." But other producers are still cutting their work forces or workweek to match lower order levels.

Foundry Equipment — Sales are off. Inquiries look good lately, and of even more significance is the increased activity on outstanding proposals. But the general feeling is that as long as their sales are sluggish, founders will hold off on major equipment purchases. (See STEEL, Mar. 24, p. 71.)

Heavy Electrical Equipment, Controls — Among the capital goods markets, this one continues to have the brightest outlook at home and abroad. While orders have slipped momentarily, they are still at a high level. Power-short European countries are heavily in the market for large generating equipment. Most producers of this type equipment are booked through 1958. Makers of controls are feeling the effects of the recession, with orders and backlogs declining substantially.

Industrial Furnaces—Orders have started to pick up slightly, but they are considerably beneath the year-ago levels. Backlogs are down about 15 to 20 per cent from the Jan. 1 mark. But producers expect enough of an upturn in the second half to make 1958 about equal to 1957. (See STEEL, Feb. 3, p. 65.)

Machine Tools—The upturn of orders industry-wide is so slight that individual producers will tell you it doesn't exist. But at least the sharp downtrend has stopped. Backlogs are holding steady, mainly because of reduced shipments. This industry, more than most other capital goods industries, is aiming at the replacement market (see box on this page). Employment is still downtrending slightly, but there are signs of stability throughout the industry at present levels. (See STEEL, Feb. 3, p. 67.)

Material Handling Equipment — Inquiries are picking up, and prices are firming, indicating that better things are in store. One sales manager says dealers were cutting their profit margins to 1 per cent or less before Feb. 1 to land a sale. Pencils are still sharp, but there is no great price cutting today. Producers are counting on cost-cutting applications to tide them over until the next round of expansion.

Mining Machinery—Backlogs are fairly stable in this industry. While one sales manager claims his company bottomed last November, he admits that sales have failed to move up much. Modernization has always been the pitch of this industry, especially for coal mining equipment. One company looks for an upturn later this year that will result in a 5 per cent increase for 1958 over 1957.

Steel Mill Equipment—Foreign demand is holding up well, resulting in rising backlogs for some companies. Domestic demand shows signs of perking up, with at least one major steel mill ordering three continuous annealing lines this month. Employment is steadier in this industry than in most other capital goods plants.

Welding Equipment—Arcwelding equipment is a bright spot in the capital goods field (STEEL, Mar. 10, p. 81), with orders slightly above the year-ago level. Resistance welders are well off that pace, even though orders have climbed a bit since Jan. 1.

Timken Modernizes

Modernization of its Canton and Columbus, Ohio, plants, plus new equipment for its Bucyrus, Ohio, operations, will cost Timken Roller Bearing Co. more than $3 million. About 117 machines have been ordered.

Development of the machinery by Heald Machine Co., and Cincinnati Milling Machine Co., has been underway for some time. Delivery will be made late this year.

Wheeling Makes Progress

Wheeling Steel Corp. expects to complete its $4.5 million improvement and modernization program at Benwood, W. Va., in June, says H. Nelson Lang, general manager.

Major pipe finishing, pipe warehousing, and shipping operations are being consolidated. A one-bay extension is being added to the pipe warehouse, and the building is being converted to a combined finishing department. A new pipe warehouse is being constructed, and almost 2 miles of railroad tracks have been installed.

How to measure productivity becomes prime problem as . . .

Auto Talks Get Rolling

BOTH the United Auto Workers and the Big Three car companies have vowed to make productivity the key factor in measuring wage and fringe increases. Apparently they even agree on basic statistics. The big debate involves the method of figuring output per manhour.

Auto firms want to use the average annual rate of change over a long period; UAW wants to apply the least squares trend over a short span.

The difference to the car companies would be about $90 million in labor costs for a two-year period. The 2.6 per cent annual improvement factor suggested by carmakers (from Joint Economic Committee data) would boost the average worker's pay 7 cents an hour; UAW's 3.9 per cent factor would make for a 10-cent hourly jump.

Speculation is running high that this will be the compromise: The carmakers' method will be used—but figured over a period more favorable to the union.

The companies might be willing to settle for that if fringes are included under the factor. That's their main contention: Any increase in labor costs must be coupled to an increase in output per manhour.

Says Louis G. Seaton, GM's vice president-industrial relations: Anything above 2.6 per cent would be inflationary. That's a contract cost GM is determined to avoid. (The firm says 2.6 per cent is generous since the average annual gain is only 2.1 per cent when you figure back to 1909.)

Favor Firms—Three factors favor a compromise in the companies' direction: 1. The high level of finished car inventories. 2. Mounting unemployment (nearly 15 per cent of the autoworkers are laid off). 3. Poor auto sales, with little sign of an upturn.

The UAW is getting more reluctant to talk about the willingness of members to strike. Says Walter Reuther: "We don't want a strike and will do everything in our power to avoid it." (STEEL still bets 4 to 3 against one.)

It's a pretty sure bet that the method of figuring productivity will get more attention (and cause more fiery oratory) than any other issue in the parleys. General Motors talks opened Mar. 25; Ford debates start today (Mar. 31); Chrysler negotiations begin tomorrow.

Solid Start—There's some speculation that GM released its productivity theory primarily for its propaganda value. It wants its story told to the public. But the plan is more than a gimmick: It's GM's basic stand on the all-inclusive productivity issue.

The UAW's rebuttals: 1. Productivity velocity is increasing, so only recent years should be counted in the measurement. 2. Labor should get a growing share of the product dollar. It can be taken from profits

without causing a price hike, the union contends. 3. If carmakers won't settle for that, they'll have to share profits with workers.

Says Mr. Reuther: "We're dead serious" about the profit sharing plan. But most labor seers still believe he'll try to swap it for something else—possibly pension improvements or bigger SUBenefits.

Auto companies are violently opposed to the profit sharing gimmick. Since they're in the driver's seat this year, chances are good that the plan will be dropped—temporarily. It's sure to pop up later when its chances for adoption are better.

Creeping Menace? — Carmakers are becoming warier about SUB. They've been exploring its long term implications and want to apply the brakes before it evolves into an expensive Guaranteed Annual Wage. But current conditions—unemployment, short workweeks—make it a bad time, from a public relations standpoint, to call the halt. The UAW will be loud in its demand for SUB liberalization. Chances of its being placed on a modified daily basis are improving. So are possibilities of other modifications. But companies will demand that liberalizations be covered by the current rate of payment (5 cents per manhour).

Point at Issue—Reflecting the feeling of laid off workers, Mr. Reuther is sure to demand greater protection of seniority rights. And he'll give priority to demands for eliminating wage rate "inequities." Severance pay, job transfer rights, and pensions will also get the spotlight. But the most (and probably the loudest) talk will center on the productivity issue. That's the real bread-and-butter point.

Sidelight—Two rival unions—Society of Skilled Trades and American Federation of Skilled Crafts—are working hard to win skilled workers away from the UAW. They are filing about 30 petitions with the National Labor Relations Board for representation elections. The first six requests affect 8000 craftsmen. Before elections can be held, the NLRB has to make a decision concerning what kinds of workers fall within the rival unions' jurisdictions. That means most elections will be delayed until after the June 1 contract deadline.

Exec Pay: Its Profit Role

Study shows a company usually gets the type of performance it pays for. High compensation will attract more aggressive younger men into the firm

DO HIGHLY paid executives create above-average profits? Or do they make big money because their firms make big profits?

A survey of 71 large companies in 15 industries by McKinsey & Co., Chicago management consultant, uncovers several implications in this "chicken-or-egg" riddle:

1. Within each industry, the company that paid executives the highest percentage of total payroll earned an average of 17.2 per cent on invested capital in 1956. That's twice the amount earned by the companies which paid the least.

2. Over a ten-year period, the profit gains of the top paying companies were twice the industry average. They were more than ten times greater than the increases of the lowest paying firms.

"Obviously, pay alone does not produce higher profits," relates Arch Patton of McKinsey. "And the intangibles of company leadership and background which strongly influence profitability cannot be measured. But the study does indicate a direct correlation between return on investment and level of executive pay."

Some Differences — Mr. Patton says: "Top paying firms tend to expect more of their executives than the average company does. Higher performance, in turn, is liberally rewarded to encourage development of still higher standards."

The study indicates that companies with high executive salaries tend to regard individual performance as the key to reward—and penalty. A majority of these firms have incentive bonus plans. Lower paying firms compensate executives with straight salary or some form of profit sharing rather than performance-based incentive pay.

Competition appears to be a major element in establishing executive pay (see chart). The chemical and automotive industries are characterized by keen competition. Note that the five lowest paying industries are more subject to government influences than the other ten, either because of U. S. regulations or because Uncle Sam is the dominant customer.

Fringes for Brass — More companies are regarding compensation as a motivational factor rather than merely a business cost. So they boost executive takehome pay and postretirement income. Of 641 firms surveyed by McKinsey, 55 per cent had stock options for executives in 1956, vs. 47 per cent a year earlier. Deferred compensation is gaining popularity, too: 26 per cent reported plans, vs. 17 per cent a year earlier.

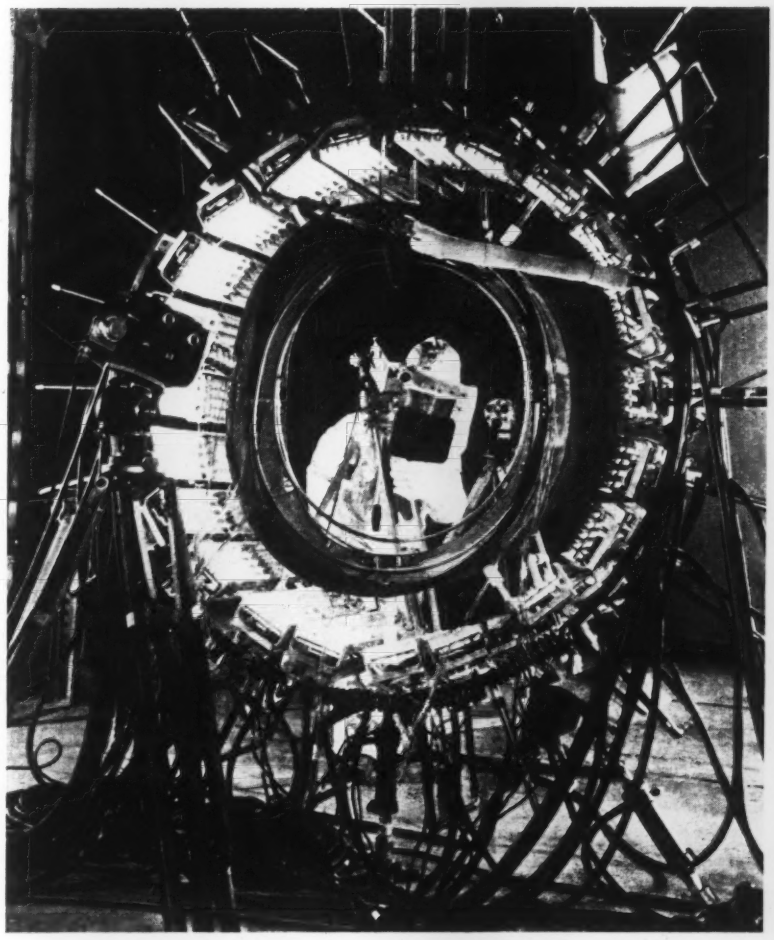
The key to higher-than-average profits is the skill with which top management makes decisions. If managing is well done, believes Mr. Patton, chances are that compensation will be above average.

Who Pays What

(How executive pay varies by industry, vs. average)

Chemical	53% Above
Automobile	29 "
Petroleum	22 "
Steel	17 "
Nonferrous Metals	15 "
Food	14 "
Container	Average
Rubber	6% Below
Electrical Equipment	11 "
Retail Chain	19 "
Airlines	34 "
Utilities	36 "
Airframe	37 "
Meat Packing	42 "
Railroad	43 "

Source: McKinsey & Co., Chicago.



A metal ring is being tortured by simultaneous heating and cooling. It represents part of the X-15 fuselage. North American engineers are studying effects

X-15 Has Stainless Skin

STAINLESS steel is used extensively in North American Aviation Corp.'s experimental X-15 rocket plane to combat high temperatures generated in flight.

At Mach 4 (2720 mph above 35,000 ft), skin temperatures reach about 1000° F. Although the X-15 is expected to fly faster than Mach 5 (3600 mph) and higher than 100 miles, air friction will be slight at the altitudes it will reach peak speed. Aerodynamic heating will pose problems during re-entry into the heavy atmosphere.

Why Stainless—The material retains rigidity under fatigue conditions encountered in hypersonic flight; it maintains aerodynamic properties under high temperatures; and it resists corrosion and oxidation when it is exposed to a blast of superheated air and exhaust gases.

High temperature alloys were selected for the X-15's airframe and skin. Its skin and wings are stainless, including protrusions, controls, wires, plumbing, and actuators.

Fabrication — Some techniques used in forming X-15 components were developed by North American for its Navaho configuration missiles and the F-100. New alloys in the form of lightweight sheets and extrusions make higher altitudes and speeds possible.

Among the fabricating techniques used, these stand out:

- Chemical milling — used extensively in making side panels.
- Fastener reduction — joining of the X-15's components approaches missilemaking techniques in use of fewer fasteners (about 65 per cent is welded structure and 35 per cent fastened, vs. 100 per cent fastened structures in current planes).
- Welds—automatic fusion and resistance welding are used.
- Brazing — used for hydraulic tubes, it reduces the chance of leaks.

Temperature Tests — The X-15 will be subject to unprecedented variations in temperatures, air loads, and "G" loads. Temperature tests differ from those used for other aircraft. For example, it takes 870 kilowatts of power output to test the plane's components, vs. 250 kilowatts needed to test F-100 parts.

Timing is also important. In testing the X-15, temperatures are reached at measured intervals. Constant temperatures are used to test F-100 components.

The craft's heating rate will be 70 times faster than that of the F-107 (Mach 2) jet plane. Temperature ranges: From about 1000° F to −300° F—the temperature of the liquid oxygen fuel. Refrigerated air will blow through many areas to cool fluids, components, and systems.

Features—Its builders claim the X-15 could be made into a recoverable manned satellite without extensive modifications. It will land on steel shoes at the end of short struts which pop out from the aft fuselage section. It also has a conventional nose wheel.

In an emergency, the entire cockpit becomes the pilot's escape capsule. If he bails out, the insulated cockpit protects him from scorching heat at extreme speeds. Should cabin pressure be lost, a tailor-made space suit maintains normal pressure and atmosphere environment.

Why — Half plane, half missile, the X-15 will be valuable for studying psychological and physiological effects on a space pilot. After initial flights by North American, it will be turned over to the National Advisory Committee for Aeronautics for friction heat studies.

Gloom, Doom Talk Starts To Drop Off

TWO SENATORS from different parts of the country talked more positively about the state of the economy last week than any legislators have since the recession fever hit Capitol Hill.

Said Sen. Irving Ives (R., N. Y.): "Too many people are scared. All of us know the situation is serious enough. The only argument is on timing. Let's not plunge into any tax cut which would create an inflation causing further distress." Senator Ives has a modest four-point program (with seven other senators) for channeling federal spending into distressed areas, stimulating home and highway construction, and extending unemployment compensation.

Carlson Sees the Silver Lining

Sen. Frank Carlson (R., Kans.) believes "there is too much pessimism." He predicts, in the near future, a "dynamic upswing in our economy." Prospects include, he says: 1. Steel output at a rate of 115 million tons a year before 1958 is over. 2. Defense orders at an annual rate of $26 billion (compared with last fall's rate of $12 billion). 3. Gross national product at a $444 billion annual rate by the fourth quarter (up $10 billion from 1957's fourth quarter). 4. A $12 billion increase in the annual rate of consumer expenditures by the fourth quarter. 5. A 6 to 8 per cent increase in the annual rate for housing starts. 6. Bank credit will be up $5 billion during the year. 7. A $1 billion increase in spending on research and development by the government, industry, and universities. By 1960, he thinks we'll spend $12 billion on R&D, vs. $8.5 billion last year.

The two statements add up to slowly mounting pressure on the hill which may curb the fine plans of the more flamboyant legislators to spend our way out of this recession without regard for the consequences.

Housing stimulation has passed Congress (and amounts to little cost for Uncle Sam because it's mostly loan guarantees); highways could cost plenty, but the speedup will most likely be spread over a number of years; the pressure is lessening for a vast "PWA" program. Tax cuts will most likely receive less talk as more expensive Pentagon plans come to light—though they can't be ruled out as a vote-getting measure. States Righters are up in arms about federal extension of unemployment compensation.

New Missile Investigation in April

Small business participation in missile and space industry programs will be aired Apr. 15 by Sen. George Smathers' (D., Fla.) Government Procurement Subcommittee. Less than 3 per cent of the prime contract dollars for missiles go to small outfits, charges Senator Smathers. Some of the Pentagon's largest primes will be called up to explain their subcontracting policies toward small companies. The committee has received "many" complaints of unsuccessful attempts to obtain subcontracts.

The Air Force's Ballistic Missile Division has just announced a new small business office to keep tabs on the situation. It reports over 20 per cent of all its ballistic missile dollars go to small firms. STEEL's subcontractor list (Mar. 17, p. 49) included a number of small companies, particularly in electronics. About half the 220 subcontractors may be small firms. At least 85,000 people are involved in the program.

Army Adopts New Management Setup

The Army has moved closely to the Navy's missile management concept by naming Maj. Gen. John Medaris, Ballistic Missile Agency chief, to a job that allows him direct contact with Army Secretary Wilber Brucker and the chief of staff. (He no longer has to go through Ordnance for decisions.) This gives him in name at least, the power Adm. W. F. Raborn has had to push the Polaris program so rapidly.

Observers of Pentagon power struggles say General Medaris will have the principal assignment of bringing the Pershing (a solid fueled missile to replace the Corporal) to life before any Air Force success with the Minuteman (a solid fueled ICBM) spoils the Army's bid for missile equality with the AF. He also gets official charge of Jupiter production and Army participation in space programs set by the Advanced Research Projects Agency.

Evidence that Jupiter production is well on the way: Goodyear Aircraft Corp. has a $1 million contract for nose cones.

Scrap Export Policy Set for '58

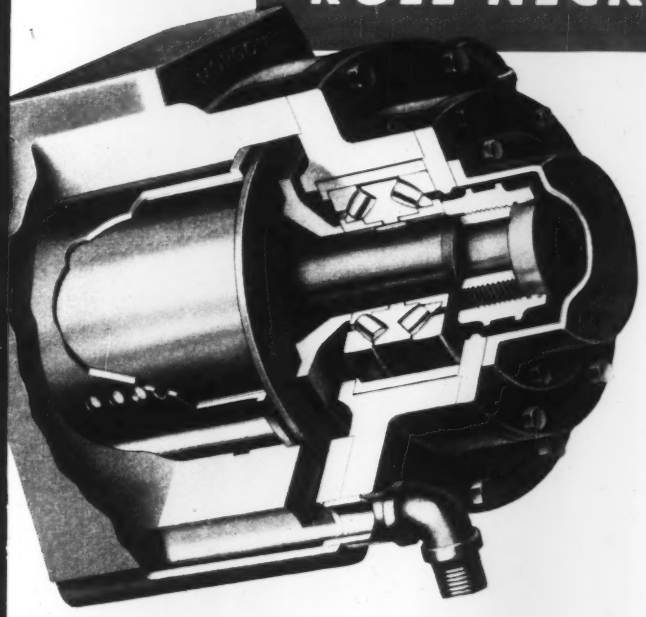
No limitations will be set on the amount of iron and steel scrap to be exported in 1958, says the Commerce Department. Previously, Commerce had O.K.'d "open-end" licensing of exports by the quarter.

Capitol Notes

Tariff Commission will soon announce dates of hearings on tungsten ore imports . . . The Army let contracts for trucks to Willys Motors Inc., Chrysler Corp., Utica-Bend Corp., and Mack Trucks Inc., while three other firms and Mack compete for an order for 3000 five-ton jobs; almost 5000 trucks come up for bids in another 15 days (total value of all contracts is $100 million).

Morgan Quality in Action

MORGOIL
ROLL NECK BEARINGS



These 26″-90 MORGOIL Bearings are operating in a 10½″ & 30″ x 30″ single stand four high reversing cold mill at Lombarde Falck in Milan, Italy. Hot mills or cold mills, ferrous or nonferrous, at home or abroad, MORGOILS give the best roll neck bearing performance at the lowest cost.

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This Vertol Model 44 is lifting a 4115-lb pump by an external sling

'Copters Catch on

A WESTERN steel producer wanted to survey a potential mining site. Doing it on foot meant a difficult and time consuming job.

A Pittsburgh executive wanted to reach a plant 100 miles away, but driving through city traffic to the airport represented a waste of valuable time.

A Louisiana offshore oil rig operator was looking for the quickest, most economical way to ship supplies and men from the mainland.

Solution — Each man solved his problem with industry's newest transportation tool: The helicopter. A helicopter did the geographic survey in 3 hours. It would have taken several days on foot. The Pittsburgh executive arrived at his destination at the same time he would have arrived at the airport via car. The oil rig operator secured the services of a helicopter firm which flew 80,000 passengers to and from offshore oil rigs in 1956 and an estimated 150,000 in 1957.

Whirlybird Boom — Helicopters have a distinguished war record and still serve a lot of military duties. (Kaman Aircraft Corp., Bloomfield, Conn., serves only military buyers and ended 1957 with the biggest backlog of orders in its history—$35 million.) But more and more manufacturers think helicopters can serve private industry as well as they do the military.

Heavy Backlogs—Increased industry interest explains the $67 million in unfilled civilian orders held by helicopter manufacturers at the end of 1957. The Helicopter Council, Aircraft Industries Association of America Inc., Washington, reports civilian users accounted for $53.4 million of $337 million in sales by the 12 major helicopter producers in 1956.

Private industry's interest in expanding marketing, conserving executive time, and cutting the cost of handling materials will lead to a 20 to 30 per cent gain in civilian sales this year, industry spokesmen told STEEL. "About 750 helicopters are, or have been, in commercial service," reports D. R. Berlin, president, Vertol Aircraft Corp., Morton, Pa.

"Corporations, now a small market, are destined to account for 25 to 30 per cent of rotary wing aircraft sold in future years," he predicts.

Users — Westinghouse Electric Corp., Pittsburgh, built a heliport atop a shipping building at its East Pittsburgh, Pa., plant. Helicopters, provided by a local firm, can make rapid, direct shipments to customers within a 100-mile radius.

James S. Ricklefs, president, Rick Helicopters Inc., San Francisco, owns a fleet of 30 whirlybirds which are used on such projects as aerial photography, power line patrol, wire laying, executive transportation, and surveying.

Multiple Tasks—"With our fleet of 39 helicopters, we are servicing radar sites above the Arctic Circle, ferrying surveyors into the Utah mountains, and flying nearly 10,000 men monthly between shore bases and drilling rigs as far as 75 miles offshore," reports R. L. Suggs, president, Petroleum Helicopters Inc., Lafayette, La.

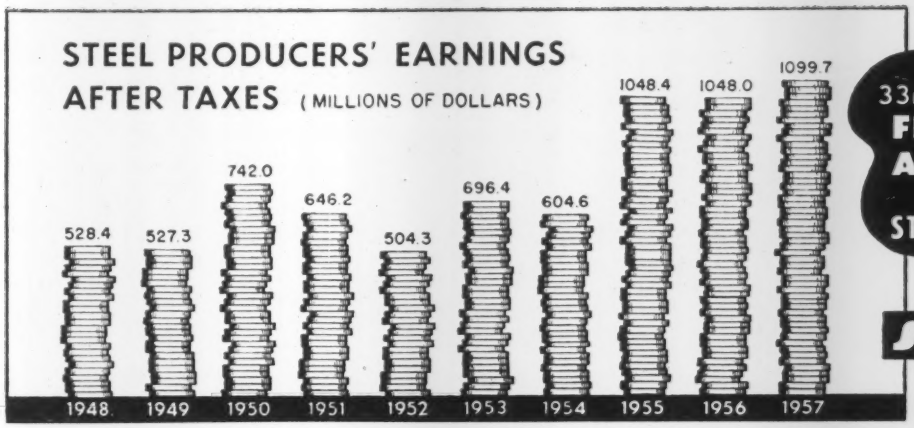
"Helicopters are indispensable to commercial operators as well as military planners," points out Stanley Hiller Jr., president, Hiller Helicopters, Palo Alto, Calif. "In 1957, military sales increased 10 per cent over those of the previous year, while the commercial market improved by 36 per cent.

Proportions — "Our commercial business will constitute about 30 per cent of our production in 1958. We expect a 30 per cent increase in commercial sales this year," say executives of Bell Helicopter Corp., Ft. Worth, Tex.

"Sales volume of helicopters this year will be about 50 per cent above that of five years ago," believes F. L. Doblhoff, chief helicopter engineer, McDonnell Aircraft Corp., St. Louis.

Upward Trends—"Sales of commercial helicopters have increased about 20 per cent yearly for the last five years," adds J. E. Leonard, manager, military requirements, Cessna Aircraft Co., Wichita, Kans.

Looking ahead to 1965, AIA predicts military uses of whirlybirds will account for only 40 per cent of output. Spokesmen for the industry think that by that time executives will be using the company helicopter more frequently than they do the company airplane now.



33rd ANNUAL **FINANCIAL ANALYSIS** OF THE **STEEL INDUSTRY**

Supplement to **STEEL**

March 31, 1958

Steel Sales and Profits Set Records

THE U. S. steel industry scored new highs in dollar volume of sales and net profits in 1957.

The profit total—$1.18 billion—is 5.3 per cent above 1956's $1.12 billion. These industry figures are based on performance of 32 of the 33 companies in STEEL's 33rd Annual Financial Analysis of the Steel Industry. The 32 companies, representing 93.28 per cent of the nation's steelmaking capacity, had a total net income of $1,099,716,473 in 1957, compared with $1,047,965,887 in 1956.

Although the industry's net profits hit a new high in 1957, 21 of the companies turned in less than record performances. Their earnings were lower in 1957 than they were in 1956.

The physical volume of steel production in 1957 was 2.1 per cent below that of 1956. The mid-1957 rise in steel prices was sufficient to offset the effects of a decline in production. Total sales of 32 companies moved up 3.6 per cent from 1956, although 16 of them recorded declines.

Record dollar sales, along with gains from new equipment and improved practices in steelmaking, gave the industry its best year in dollar volume of net profits. The new equipment was installed to modernize and to expand the industry's capacity. The 1957 capacity was 4.0 per cent larger than that of 1956.

Profit per dollar of sales was up slightly in 1957—7.37 cents, compared with 7.28 cents in 1956. Among years that were better were 1950 (7.99 cents), 1955 (7.82 cents), and 1940 (7.48 cents).

Although the industry gained in earnings in 1957, the federal government got more, too—6.1 per cent more in income taxes than it got in 1956. As a result, the 32 companies paid almost as much in income taxes in 1957 ($1,052,995,210) as they had left as net profit ($1,099,716,473).

Net income per ton of ingots produced rose to $10.48 in 1957 from 1956's $9.94. Net income per ton of ingot capacity barely moved up ($8.88 in 1957, vs. $8.85 in 1956) because of the substantial increase in capacity.

Employment costs continued to rise in 1957. They were 9.5 per cent higher than those of 1956. The jump came from a 2.3 per cent increase in the number of employees and an automatic boost of steelworkers' wages at midyear.

Not only were there more employees in the steel industry in 1957 than in 1956, but there were more owners. The number of holders of common stock rose 14.4 per cent. But the number of holders of preferred stock declined about two-tenths of 1 per cent, in line with the trend of the industry to eliminate preferred stock. Another trend—splitting of shares of common stock—is reflected by a 26.1 per cent jump in the number of shares of common stock outstanding. This expansion was large enough to lower the net income per common share from $6.65 in 1956 to $5.55 in 1957, despite the increase in total net profits.

To help pay for modernization and expansion of facilities, the industry increased its long term debt 7.1 per cent in 1957 over what it was in 1956. As a result, interest and expense on long term debt rose 6.9 per cent.

Expansion of the steel industry and the higher cost of new facilities are reflected in the amount set aside for depreciation, amortization, and depletion. The 1957 total for such purposes was 2.3 per cent above that of 1956. Fast amortization of facilities installed during the Korean War emergency is tapering off and comprises a reduced proportion of the over-all total of depreciation.

Under fast amortization, companies were permitted to recover larger than normal amounts on certain new facilities. This had the effect of lowering net profit and, in turn, reducing federal income taxes. As fast amortization runs out, federal income taxes come in for a bigger bite.

Enlargement of the steel industry's capacity is reflected in total assets. They rose 8.1 per cent. Current assets and current liabilities fluctuated only slightly. As a result, the ratio of current assets to current liabilities remained unchanged—2.43 to 1.

THIS SPECIAL REPORT is compiled from data from 33 producers representing 93.94 per cent of the steelmaking capacity in the United States

Bold face type is used under those columns in which figures from all 33 companies were not received. NA=Not Available.

	Rated Ingot Capacity Net Tons 1957	1956	Ingot Production Net Tons 1957	1956	Steel Operating Rate, Per Cent 1957	1956	Net Income Per Ton Ingots Produced 1957	1956	Net Income Per T Ingot Capacity 1957	195
United States Steel Corp.	39,582,000	39,215,000	33,738,000	33,402,000	85.24	85.18	$12.43	$10.42	$10.60	$8.
Bethlehem Steel Corp.	20,500,000	20,000,000	19,123,201	18,322,308	93.28	91.61	9.99	8.81	9.32	8.
Republic Steel Corp.	11,047,000	10,262,000	8,484,615	9,348,898	76.80	91.10	10.02	9.67	7.70	8.
Jones & Laughlin Steel Corp.	6,900,000[3]	6,166,500	6,048,000	5,997,000	87.65	97.25	7.52	7.52	6.59	7.
Youngstown Sheet & Tube Co.	6,240,000	5,750,000	5,137,834	5,406,016	82.34	94.02	8.27	7.99	6.81	7.
National Steel Corp.	6,200,000	6,000,000	5,326,425	5,640,393	85.91	94.01	8.55	9.31	7.34	8.
Armco Steel Corp.	5,950,000	5,150,000	5,406,646	5,220,147	90.87	101.36	10.18	12.57	9.25	12.
Inland Steel Co.	5,500,000	5,200,000	5,502,707	4,915,576	100.05	94.53	10.70	10.78	10.70	10.
Colorado Fuel & Iron Corp.	2,799,500	2,500,166	2,163,594	2,216,248	77.29	88.64	6.58	5.74	5.09	5.
Wheeling Steel Corp.	2,200,000	2,130,000	1,828,534	1,994,745	83.12	93.65	6.61	8.86	5.49	8.
Sharon Steel Corp.	1,898,000	1,763,000	1,204,283	1,508,660	63.45	85.57	3.36	4.58[22]	2.13	3.
McLouth Steel Corp.	1,574,000[15]	1,380,000	1,534,240	1,372,592	97.47	99.46	6.13	6.42	5.98	6.
Kaiser Steel Corp.	1,536,000	1,536,000	1,590,322	1,617,681	103.54	105.32	13.48	14.57	13.96	15.
Detroit Steel Corp.	1,500,000	1,290,000	562,477	1,032,237	37.50	80.02	5.34	8.47	2.00	6.
Crucible Steel Co. of America	1,424,530	1,423,400	NA	NA	NA	NA	NA	NA	4.59	8.
Pittsburgh Steel Co.	1,320,000	1,320,000	1,223,534	1,139,882	92.69	86.35	3.40	5.46	3.15	4.
Granite City Steel Co.	1,200,000	1,080,000	1,116,698	1,151,620	93.06	106.63	8.94	13.12	8.32	13.
Allegheny Ludlum Steel Corp.	864,200	864,200	495,280	666,918	57.31	77.17	23.53	22.88	13.48	17.
Northwestern Steel & Wire Co.[10]	825,000	825,000	703,752	692,326	85.30	83.92	7.43	7.33	6.33	6.
Alan Wood Steel Co.	800,000	625,000	655,536	713,859	81.94	109.13[29]	3.13	4.34	2.57	3.
Lukens Steel Co.	750,000	750,000	758,212	703,434	101.09	93.79	13.35	10.67	13.49	10.
Copperweld Steel Co.[12]	660,000	618,380	[13]	[13]	[13]	[13]	[13]	[13]	[13]	
Lone Star Steel Co.	550,000	550,000	666,853	629,579	121.25	114.47	16.99	16.12	20.60	18.
Laclede Steel Co.	520,000	500,000	452,005	505,575	86.92	101.12	8.49	8.08	7.38	8.
Keystone Steel & Wire Co.	450,000	425,000	395,236	438,364	87.83	103.14	16.44	18.28	14.44	18.
Continental Steel Corp.	420,000	394,000	338,508	368,059	80.60	93.42	8.14	7.59	6.56	7.
Atlantic Steel Co.	400,000	400,000	229,807	226,970	57.45	56.74	1.52	3.70	0.87	2.
Carpenter Steel Co.	86,602	73,667	77,574	73,925	89.58	100.35	88.16	78.46	78.97	78.
Universal-Cyclops Steel Corp.	70,160	70,160	50,061	63,211	71.35	90.10	58.69	61.33	41.88	55.
Eastern Stainless Steel Corp.	50,000	50,000	36,214	42,223	72.43	84.45	50.59	53.31	36.64	45.
Vanadium-Alloys Steel Co.[11]	42,000	42,000	18,578	17,065	44.23	40.63	145.76	140.93	64.48	57.
Jessop Steel Co.	35,740	33,490	28,007	33,307	78.36	99.45	37.92	45.92	29.71	45.
Totals (or averages)	123,894,732	118,386,963	104,896,733	105,460,818	84.67	89.08	$10.48	$9.94	$8.88	$8.
Barium Steel Corp.[34]	846,760	.....	585,993	.....	69.20	....	NA	....	NA	

	Number of Shares of Common Stock Outstanding 1957	1956	Common Stock Valuation 1957	1956	Preferred Stock Valuation 1957	1956	Book Value Per S of Common Sto 1957	
United States Steel Corp.	53,753,622	53,699,617	$895,893,700	$894,993,617	$360,281,100	$360,281,100	$49.07	$
Bethlehem Steel Corp.	4[4],644,188[19]	10,105,462	524,594,305	376,612,630	93,388,700	93,388,700	33.45[19]	1
Republic Steel Corp.	15,595,101	15,510,288	156,055,631	155,317,286	None	None	44.71	
Jones & Laughlin Steel Corp.	7,785,316	6,582,742	77,490,000	65,534,000	29,357,000	29,357,000	62.07	
Youngstown Sheet & Tube Co.	3,441,648	3,422,073	110,624,638	109,647,308	None	None	126.78	1
National Steel Corp.	7,425,622	7,404,318	74,256,220	74,043,180	None	None	59.17	
Armco Steel Corp.	11,993,471	10,879,827	119,934,711	108,798,267	None	None	42.33	
Inland Steel Co.	5,692,763	5,617,973	105,574,831	100,514,559	None	None	71.49	
Colorado Fuel & Iron Corp.	3,384,463	3,383,559	16,839,641	16,835,119	9,778,736	10,560,336	40.01	
Wheeling Steel Corp.	1,936,653	1,936,029	19,366,530	19,360,290	35,230,600	35,749,600	82.79	
Sharon Steel Corp.	1,100,000	1,100,000	11,060,390	11,060,390	None	None	71.69	
McLouth Steel Corp.	1,487,000	1,487,000	3,717,500	3,717,500	29,389,550	21,736,100	35.49	
Kaiser Steel Corp.	3,249,500	3,246,500	3,249,500	3,246,500	37,875,375	38,501,625	32.54	
Detroit Steel Corp.	3,021,832	3,018,932	3,021,832	3,018,932	4,043,576	4,650,582	18.80	
Crucible Steel Co. of America	3,791,486	3,636,456	47,393,581	45,455,719	None	None	30.66	
Pittsburgh Steel Co.	1,585,890	1,519,165	15,858,900	15,191,650	24,194,300	24,194,300	42.25	
Granite City Steel Co.	2,127,717[27]	2,127,044[27]	26,597,456	26,593,712	1,965,800	2,307,100	37.16	
Allegheny Ludlum Steel Corp.	3,852,790	3,781,667	3,852,790	3,781,667	None	None	27.79	
Northwestern Steel & Wire Co.[10]	2,502,113	2,453,475	12,510,565	12,267,375	None	None	11.25	
Alan Wood Steel Co.	696,007	696,007	6,960,070	6,960,070	4,839,800	4,839,800	39.47	
Lukens Steel Co.	953,928[31]	317,976	3,179,760	3,179,760	None	None	42.98	1
Copperweld Steel Co.[12]	1,086,191	790,601	5,430,955	3,953,005	2,445,950	3,362,400	37.80	
Lone Star Steel Co.	2,904,000	2,640,000	2,904,000	2,640,000	None	None	16.67	
Laclede Steel Co.	206,250	206,250	4,125,000	4,125,000	None	None	127.44	1
Keystone Steel & Wire Co.	1,875,000	1,875,000	2,604,167	2,604,167	None	None	20.43	
Continental Steel Corp.	516,401	501,620	7,229,614	7,018,789	None	None	45.87	
Atlantic Steel Co.	396,500	389,380	2,000,000	2,000,000	700,000	700,000	29.97	
Carpenter Steel Co.	854,496	854,496	4,272,480	4,272,480	None	None	42.29	
Universal-Cyclops Steel Corp.	1,025,431[32]	498,287	1,025,431[32]	498,287	None	None	22.59[32]	
Eastern Stainless Steel Corp.	717,307	600,486	3,586,535	3,002,430	None	None	30.21	
Vanadium-Alloys Steel Co.[11]	560,950	508,503	2,830,000	2,000,000	None	None	30.72	
Jessop Steel Co.	570,419	494,219	570,419	494,219	None	None	17.80	
Totals (or averages)	190,734,055	151,284,952	$2,274,611,152	$2,088,737,908	$633,490,487	$629,628,643	.....	
Barium Steel Corp.[34]	4,149,495	....	4,149,495	....	None	.....	6.14	

[1] Excluding amount maturing within one year.
[3] After federal income taxes but before interest on long term debt.
[4] Including 300,000 net tons of Rotary Electric Steel Co. transferred April 30, 1957.
[5] Plus stock dividend of 3 per cent.
[8] Includes extraordinary income of $504,292 in 1957 and $2,979,371 in 1956.
[6] Includes set-asides of $6,810,000 in 1957 and $3,678,500 in 1956 for future income taxes.
[7] Excluding securities worth $19,097,800 segregated for plant additions.
[8] Plus stock dividend of 3 per cent.
[9] Stock
[10] Fiscal
[11] Fiscal
[13] 1957 months effecti

FINANCIAL ANALYSIS OF THE

r Ton city 1956	Capitalization Per Ton Ingot Capacity 1957	1956	Average Number Employed 1957	1956	Total Employment Costs 1957	1956	Long-term Debt[1] 1957	1956	Surplus 1957	1956	1957
$8.88	$81.21	$76.73	271,037	260,646	$1,861,945,136	$1,680,969,302	$216,547,272	$245,023,677	$1,741,644,377	$1,508,698,089	$3,214,366
8.07	85.76	80.42	167,328	152,443	1,000,684,128	860,460,026	171,212,500	278,621,000	968,809,371	859,734,079	1,758,004
8.81	69.99	68.04	65,110	68,918	433,315,252	418,849,780	75,983,700	40,754,784	541,151,244	502,176,924	773,190
7.32	93.87	94.29	43,948	40,999	287,022,000	254,627,000	135,071,000	130,275,000	405,776,000	356,260,000	647,694
7.51	82.53	87.67	30,287	31,502	192,483,794	184,276,768	95,500,000	98,750,000	325,721,488	289,967,204	531,846
8.75	88.87	88.72	27,444	29,204	198,589,029	194,604,451	111,790,998	110,000,000	364,957,597	348,269,165	551,004
2.74	101.37	93.26	32,553	32,539	228,692,211	213,931,903	95,460,000	51,330,000	387,756,090	320,181,532	603,150
10.19	105.96	95.72	29,227	28,743	184,822,125	164,741,277	175,814,900	129,236,200	301,384,563	268,006,937	582,774
5.09	70.41	73.61	22,512	22,080	141,712,953	132,413,500	51,937,000	45,040,000	118,560,389	111,597,575	197,115
8.30	107.75	111.01	13,253	14,384	101,675,755	95,818,498	41,469,900	44,151,900	140,974,053	137,190,408	237,041
3.92[22]	48.51	46.92	8,087	8,559	47,075,422	47,564,306	13,200,000	4,600,000	67,802,572	67,055,800[23]	92,062
6.38	97.25	89.30	3,494	3,470	25,841,947	22,734,588	70,913,000	56,296,000	49,049,716	41,483,329	153,069
15.35	242.92	159.62	11,212	10,550	75,206,000	66,530,000	229,515,123	118,921,921	102,486,518	84,507,507	373,126
6.78	56.56	67.98	3,839	5,071	26,046,337	32,725,863	24,000,000	26,000,000	53,779,138	54,026,855	84,844
8.97	99.16	98.68	15,453	16,226	92,979,242	94,272,419	25,018,772	27,900,732	68,845,039	67,104,069	141,257
4.72	94.09	95.39	9,689	10,109	68,472,939	62,964,261	33,002,895	36,098,763	51,139,742	50,428,252	124,195
13.99	99.02	105.41	4,943	4,979	30,980,539	29,507,522	37,800,000	35,950,000	52,464,121	48,994,100	118,827
17.66	167.77	162.79	14,800	15,442	100,436,494	99,134,045	37,936,200	39,609,900	103,201,984	97,292,414	144,990
6.15	43.67	39.97	2,937	3,008	21,195,852	18,955,372	7,865,055	8,033,769	15,650,183	12,670,706	36,025
3.87	47.91	45.90	3,798	3,788	24,625,872	23,511,115	6,020,000	5,250,000	20,510,362	19,672,716	38,330
10.01	57.40	52.79	5,650	5,282	40,142,461	32,711,063	2,050,000	4,800,000	37,822,857	31,613,924	43,052
[13]	[13]	[13]	5,294	4,287	36,475,922	29,296,941	11,979,667	8,260,000	35,623,754	24,692,578	55,480
18.46	187.64	182.50	4,271	4,578	27,654,634	23,204,700	54,800,000	63,300,000	45,499,078	34,433,570	103,203
8.17	58.24	53.67	3,510	3,742	20,988,058	21,093,467	4,000,000	2,737,705	22,158,503	19,969,856	30,283
18.25	85.13	83.67	2,660	2,737	18,365,411	18,426,840	None	None	35,703,836	32,955,673	38,308
7.09	61.17	61.26	2,568	2,745	13,852,632	14,127,915	2,000,000	2,200,000	16,460,207	14,917,126	25,689
2.10	31.46	30.78	1,838	1,917	10,749,144	10,408,140	None	None	9,884,961	9,613,705	12,584
78.74	417.31	430.64	3,417	3,311	22,943,775	21,498,783	None	None	31,867,436	27,451,143	36,139
55.26	330.16	302.78	3,365	3,873	24,042,065	24,427,774	None	None	22,138,776	20,744,566	23,164
45.02	513.45	497.35	1,147	1,232	9,345,948	9,263,084	4,000,000	8,223,000	18,085,723	13,642,133	25,672
57.26	410.26	328.08	1,557	1,444	8,844,514	8,072,462	None	None	14,401,053	11,779,223	17,231
45.67	333.55	239.81	1,230	1,275	8,484,251	8,571,344	1,768,802	None	9,581,894	7,537,129	11,921
$8.85	$87.38	$83.07	817,458	799,083	$5,385,691,842	$4,919,694,509	$1,736,656,784	$1,621,364,351	$6,180,892,625	$5,494,668,287	$10,825,651,0
.....	NA	....	4,250	.....	22,972,000	.....	10,113,000	.....	21,313,260	.....	35,575,7

er Share Stock 1956	Number of Common Stockholders 1957	1956	Number of Preferred Stockholders 1957	1956	Preferred Dividend Requirements 1957	1956	Net Earnings Per Common Share 1957	1956	Dividends Per Share on Preferred 1957	1956	Dividends Per Share on Common 1957	1956	19
$44.76	266,962	257,997	64,267	65,007	$25,219,677	$25,219,677	$7.33	$6.01	$7.00	$7.00	$3.00	$2.70	$406,00
122.34	145,654	91,247	19,142	19,621	6,537,209	6,537,209	4.13[19]	15.33	7.00	7.00	2.40[19]	8.50	175,00
42.39	94,891	90,421	None	None	None	None	5.45	5.83	None	None	3.00	2.625	89,60
64.08	49,542	43,459	5,913	5,844	1,468,000	1,468,000	5.65	6.63	5.00	5.00	2.50[4]	2.50[4]	39,90
116.78	17,395	16,595	None	None	None	None	12.35	12.62	None	None	5.00	4.50	39,06
57.04	NA	NA	None	None	None	None	6.13	7.09	None	None	4.00	4.00	43,55
39.43	58,402	53,770	None	None	None	None	4.59	6.03	None	None	3.00	2.55	54,52
65.60	27,928	26,572	None	None	None	None	10.34	9.43	None	None	4.50	4.25	60,55
37.96	23,829	21,107	2,067	2,170	557,402	613,798	4.04	3.58	5.25[20]	5.25[20]	2.00	2.00	14,92
80.86	12,354	11,253	4,880	4,726	1,761,530	1,787,480	5.33	8.20	5.00	5.00	3.40	3.10	10,11
71.01[23]	9,177	8,123	None	None	None	None	3.68	6.28[22]	None	None	3.00	3.00	3,38
30.40	4,695	3,991	1,332	2	1,432,129	1,349,807	5.37	5.01	4.625[16]	2.625	None	None	5,56
27.03	6,853	6,711	12,728	13,035	2,229,496	2,257,693	5.91	6.57	1.46	1.46	0.40	0.40	9,30
18.90	7,245	5,804	2	1	287,500	360,000	0.90	2.78	1.50	1.50	1.00	1.00	3,34
30.95	13,470	8,786	None	None	None	None	1.73	3.51	None	None	1.60	1.50	5,63
43.19	5,581	5,001	2,941	2,925	1,308,150	1,308,150	1.80	3.24	10.50[24]	10.50[24]	1.00[25]	1.00[25]	3,77
35.54	11,773	10,911	1	1	112,812	135,253	4.64	7.04	5.50	5.50	3.00	2.50	10,82
26.73	19,609	18,462	None	None	None	394	3.02	4.04	None	None	2.00	1.70	13,44
10.16	1,262	1,031	None	None	None	None	2.09	2.07	None	None	0.80	0.403	6,03
38.27	1,789	1,555	589	586	241,990	282,396	2.60	4.04	5.00	5.00	1.40	1.40[30]	1,04
109.42	3,040	1,569	None	None	None	None	10.61[31]	23.60	None	None	3.40[31]	6.00	11,70
36.23	8,375	5,644	778	938	156,046	216,036	2.41	4.08	5.00[14]	5.50[14]	2.00	2.00	2,50
14.04	11,573	10,686	None	None	None	None	3.90	3.85	None	None	[17]	None	11,57
116.82	1,628	1,604	None	None	None	None	18.61	19.81	None	None	8.00	8.00	4,67
18.97	4,254	4,240	None	None	None	None	3.47	4.27	None	None	2.00	2.00	6,39
43.73	3,155	3,072	None	None	None	None	5.34	5.57	None	None	2.00[8]	2.75	3,13
29.83	2,555	2,662	264	266	45,997	45,997	0.76	2.04	7.00	7.00	0.50	1.25	32
37.13	3,666	3,262	None	None	None	None	8.00	6.79	None	None	2.80	2.25	7,43
42.63	2,041	1,687	None	None	None	None	2.87[32]	7.78	None	None	1.00[32]	2.50	3,12
27.72	3,709	3,227	None	None	None	None	2.55	3.75	None	None	1.50	1.50	2,34
27.10	2,421	2,026	None	None	None	None	4.83	4.73	None	None	2.30	2.00	2,90
16.25	4,430	2,245	None	None	None	None	1.86	3.09	None	None	[9]	None	1,31
.....	829,249	724,720	114,904	115,122	$41,357,935	$41,581,890	$5.55	$6.65	.....	.....	.....	.....	$1,052,995
.....	15,479	.....	None	.....	None	.....	0.74	...	None	....	0.30[35]	....	3,53

ck dividend of 6 per cent.
cal year ended July 31.
cal year ended June 30.
7 figures include those of Superior Steel Corp. for 11 nths ended Nov. 30, 1957, at which time merger became ective.

[13] Comparisons would be misleading because company's operations include fabricating plants with no steel ingot capacity.
[14] Includes two classes of preferred stock.
[15] Ingot capacity revised on May 1, 1957.
[16] Includes two classes of preferred stock.
[17] Stock dividend of 10 per cent.

[18] Includes set-asides of $5,013,000 1956 for future income taxes.
[19] Reflects 4-for-1 stock split.
[20] Includes two classes of preferred
[21] Includes set-asides of $585,300 in for future income taxes.

OF THE STEEL INDUSTRY FOR

Surplus 1956	Total Capitalization 1957	Total Capitalization 1956	Provision For Depreciation, Depletion 1957	Provision For Depreciation, Depletion 1956	Total Income—Per Cent of Capitalization[2] 1957	Total Income—Per Cent of Capitalization[2] 1956	Interest on Long-term Debt 1957	Interest on Long-term Debt 1956
77	$1,508,698,089	$3,214,366.449	$3,008,996,483	$276,008,777	$277,598,963	13.27	11.82	$7,006,422	$7,666,374
71	859,734,079	1,758,004,876	1,608,356,409	110,656,878	102,459,454	11.29	10.66	7,467,835	9,973,576
44	502,176,924	773,190,575	698,248,994	40,787,933	43,059,441	11.16	13.13	1,261,442	1,306,404
00	356,260,000	647,694,000	581,426,000	44,227,000	37,009,000	7.75	8.35	4,759,000	3,419,000
88	289,967,204	531,846,126	498,364,512	40,337,908	41,520,330	8.88	9.66	3,226,302	3,252,055
97	348,269,165	551,004,815	532,312,345	46,266,264	45,344,338	8.97	10.26	3,932,260	2,121,470
90	320,181,532	603,150,801	480,309,799	34,620,270	33,328,458	9.48	14.07	2,141,407	1,989,083
63	268,006,937	582,774,294	497,757,696	25,985,912	24,402,114	10.95	11.29	4,944,576	3,185,221
89	111,597,575	197,115,766	184,033,030	11,703,979	10,387,451	8.83	8.20	3,170,107	2,362,729
53	137,190,408	237,041,083	236,452,198	15,369,129	16,172,610	5.71	8.17	1,455,495	1,635,119
72	67,055,800[23]	92,062,962	82,716,190[23]	4,038,504	4,070,287	4.83	9.32	398,884	202,796
16	41,483,329	153,069,766	123,232,929	12,604,788	12,393,634	7.18	8.33	3,283,644	3,028,545
18	84,507,507	373,126,516	245,177,553	15,879,598	15,422,210	7.69	11.86	7,324,870	5,567,311
38	54,026,855	84,844,546	87,696,369	4,674,552	4,340,459	5.22	11.81	1,428,355	1,611,517
39	67,104,069	141,257,392	140,460,520	11,039,847	11,349,222	5.39	10.06	1,063,427	1,358,427
42	50,428,252	124,195,837	125,912,965	6,756,677	6,015,006	4.61	6.23	1,565,788	1,617,670
21	48,994,100	118,827,377	113,844,912	4,868,875	5,042,814	9.62	14.47	1,443,818	1,363,456
84	97,292,414	144,990,974	140,683,981	11,024,453	11,337,277	9.03	11.70	1,434,023	1,193,043
83	12,670,706	36,025,803	32,971,850	1,791,594	1,321,128	15.57	16.59	382,965	393,134
62	19,672,716	38,330,232	36,722,586	4,136,775	4,676,619	6.36	8.89	382,421	167,646
57	31,613,924	43,052,617	39,593,684	1,805,708	1,813,932	23.97	19.63	203,486	266,892
54	24,692,578	55,480,326	40,267,983	2,610,111	1,668,798	5.90	9.30	505,669	304,688
78	34,433,570	103,203,078	100,373,570	4,074,633	3,979,721	13.67	13.90	2,775,793	3,797,893
03	19,969,856	30,283,503	26,832,561	1,403,965	1,587,244	13.16	15.63	149,660	109,856
36	32,955,673	38,308,003	35,559,840	1,251,605	1,241,038	16.96	22.53	None	None
07	14,917,126	25,689,821	24,135,915	1,328,034	1,391,384	11.07	11.97	88,250	95,750
61	9,613,705	12,584,961	12,313,705	843,951	862,966	5.75	8.96	None	None
36	27,451,143	36,139,916	31,723,623	2,132,883	1,858,041	18.92	18.28	None	None
76	20,744,566	23,164,207	21,242,853	1,519,022	1,617,104	12.68	18.25	None	None
23	13,642,133	25,672,258	24,867,563	769,451	459,799	8.19	9.68	271,850	157,281
53	11,779,223	17,231,053	13,779,223	325,849	319,440	15.72	17.45	None	None
94	7,537,129	11,921,115	8,031,348	275,626	269,805	9.65	19.28	87,952	19,022
25	$5,494,668,287	$10,825,651,048	$9,834,399,189	$741,120,551	$724,320,087	10.72	11.23	$62,155,701	$58,165,958
60		35,575,755		2,606,560		10.23		577,955	

ed 56	Dividends Per Share on Common 1957	Dividends Per Share on Common 1956	Federal Income Taxes 1957	Federal Income Taxes 1956	Total Assets 1957	Total Assets 1956	Current Assets 1957	Current Assets 1956	
00	$3.00	$2.70	$406,000,000	$331,000,000	$4,074,070,018	$3,836,250,453	$1,433,055,907	$1,325,930,935	$753,4
00	2.40[19]	8.50	175,000,000	147,000,000	2,260,340,071	2,089,998,212	1,114,087,666	1,076,538,499	437,3
ne	3.00	2.625	89,600,000	94,700,000	929,821,851	857,310,086	343,191,591	382,706,759	130,9
00	2.50[4]	2.50[4]	39,901,000	39,380,000	1,225,686,000	1,113,747,000	261,030,000	272,323,000	118,0
ne	5.00	4.50	39,066,000[6]	36,864,048[6]	636,007,884	620,608,608	292,061,441	326,463,097	91,1
ne	4.00	4.00	43,550,000	47,000,000	670,815,521	674,747,113	202,591,508	247,091,459	84,4
ne	3.00	2.55	54,521,286	63,290,322	723,362,591	612,828,489	319,753,188	308,025,615	99,6
ne	4.50	4.25	60,555,000	55,142,000	663,103,193	572,216,740	259,698,548	272,267,488	72,9
25[20]	2.00	2.00	14,926,000[21]	12,821,600[21]	274,556,183	256,660,274	127,328,512	121,431,092	57,5
00	3.40	3.10	10,116,000	18,630,000	284,061,273	289,437,176	122,065,805	124,777,937	35,3
ne	3.00	3.00	3,380,000	6,122,000	106,504,200	108,826,754	52,492,256	61,226,130	14,4
325	None	None	5,562,000	2,810,000	175,959,206	151,204,509	59,807,855	54,507,552	22,8
46	0.40	0.40	9,300,000[33]	12,055,000[33]	448,649,816	292,572,644	116,768,101	84,335,777	55,3
50	1.00	1.00	3,346,000	9,015,000	108,536,541	113,936,803	32,557,955	39,116,694	8,2
ne	1.60	1.50	5,630,000	12,910,000	164,952,387	171,783,932	72,380,043	87,361,212	19,5
50[24]	1.00[25]	1.00[25]	3,776,000	6,235,000	157,994,163	159,200,328	52,123,580	61,279,308	20,0
50	3.00	2.50	10,829,000[28]	15,800,000[28]	158,997,476	158,846,743	50,279,460	61,122,501	17,7
ne	2.00	1.70	13,441,000	16,867,000	175,582,424	182,907,662	88,767,047	101,609,908	28,4
ne	0.80	0.403	6,030,000	5,760,000	52,112,566	41,670,460	16,786,663	14,198,279	9,6
00	1.40	1.40[30]	1,047,000	2,024,000	48,653,613	47,385,882	14,815,639	16,369,456	8,1
ne	3.40[31]	6.00	11,700,000	7,675,000	57,747,429	50,146,609	33,306,035	29,476,965	11,8
50[14]	2.00	2.00	2,500,000	4,220,000	68,895,399	56,205,642	34,329,646	31,682,521	12,9
ne	[17]	None	11,570,000[18]	11,000,000[18]	134,725,378	123,689,511	46,946,850	42,016,032	10,8
ne	8.00	8.00	4,675,000	4,575,000	36,113,540	33,225,485	20,473,090	19,604,906	5,3
ne	2.00	2.00	6,393,924	7,993,443	53,632,244	44,140,949	20,076,442	19,524,046	15,3
ne	2.00[8]	2.75	3,130,000	2,810,000	29,920,552	29,301,027	14,887,913	15,199,375	3,1
00	0.50	1.25	327,000	910,114	22,663,789	23,666,831	8,700,901	9,421,802	4,4
ne	2.80	2.25	7,436,000	6,197,000	47,497,252	42,662,418	30,777,370	26,729,572	11,3
ne	1.00[32]	2.50	3,125,000	4,387,000	29,848,065	31,404,855	17,009,083	20,362,955	6,6
ne	1.50	1.50	2,340,000	2,550,000	31,386,228	32,227,515	20,798,901	24,273,768	5,7
ne	2.30	2.00	2,907,000	2,606,000	22,573,862	18,948,958	14,183,508	11,878,060	5,3
ne	[9]	None	1,315,000	1,679,000	14,066,732	11,708,707	8,592,875	8,673,538	2,1
			$1,052,995,210	$992,028,527	$13,888,837,447	$12,849,468,375	$5,301,725,379	$5,297,526,238	$2,180,4
	0.30[35]		3,536,000		52,018,642		28,603,194		7,2

[18] Includes set-asides of $5,013,000 in 1957 and $6,100,000 in 1956 for future income taxes.
[19] Reflects 4-for-1 stock split.
[20] Includes two classes of preferred stock.
[21] Includes set-asides of $585,800 in 1957 and $1,374,500 in 1956 for future income taxes.
[22] Does not include capital gain of $6,411,709 from sale of properties and securities.
[23] Includes capital gain of $6,411,709 from sale of properties and securities.
[24] Includes two classes of preferred stock.
[25] Plus stock dividend of 4 per cent.

1957

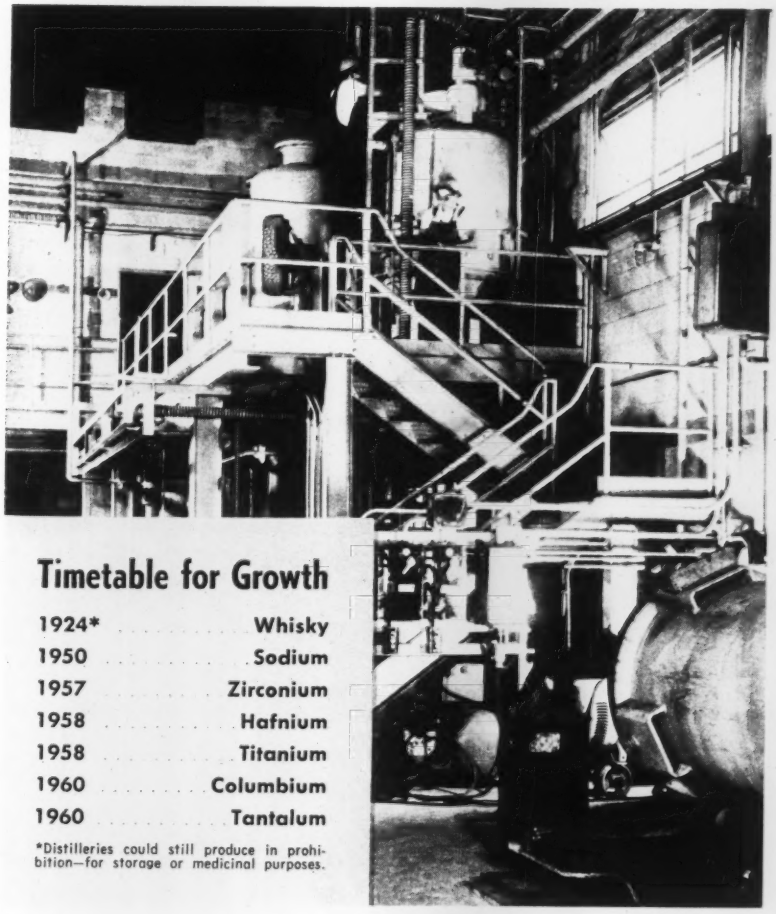
Compiled by STEEL

March 31, 1958

Net Sales 1957	Net Sales 1956	Net Profit—Per Cent of Net Sales 1957	Net Profit—Per Cent of Net Sales 1956	Net Income 1957	Net Income 1956	
$4,413,806,173	$4,228,877,241	9.50	8.23	$419,406,956	$348,098,916	United States Steel Corp.
2,624,913,123	2,343,478,150	7.28	6.89	191,025,933	161,411,625	Bethlehem Steel Corp.
1,227,257,507	1,244,214,346	6.93	7.27	85,014,422	90,406,665	Republic Steel Corp.
837,568,000	742,642,000	5.43	6.08	45,452,000	45,122,000	Jones & Laughlin Steel Corp.
688,611,592	684,041,021	6.17	6.31	42,508,579	43,174,587	Youngstown Sheet & Tube Co.
640,967,342	664,251,090	7.10	7.90	45,518,884	52,502,422	National Steel Corp.
776,736,401	761,800,102	7.09	8.61	55,044,509[5]	65,593,182[5]	Armco Steel Corp.
772,380,683	731,767,967	7.62	7.24	58,876,875	52,998,726	Inland Steel Co.
340,755,160	333,068,664	4.18	3.82	14,236,851	12,727,529	Colorado Fuel & Iron Corp.
249,756,955	259,554,918	4.84	6.81	12,077,696	17,672,276	Wheeling Steel Corp.
151,651,824	180,044,408	2.67	3.84	4,046,773	6,905,530	Sharon Steel Corp.
179,458,165	163,906,619	5.24	5.37	9,409,977	8,806,258	McLouth Steel Corp.
208,619,403	201,692,305	10.28	11.69	21,438,507	23,571,852	Kaiser Steel Corp.
82,458,616	123,616,057	3.64	7.08	3,004,382	8,747,092	Detroit Steel Corp.
235,938,306	263,922,898	2.77	4.84	6,543,594	12,767,625	Crucible Steel Co. of America
183,260,331	179,133,961	2.27	3.48	4,155,000	6,225,000	Pittsburgh Steel Co.
123,763,490	137,131,233	8.07	11.02	9,984,451	15,109,411	Granite City Steel Co.
267,647,586	287,078,052	4.35	5.32	11,651,851	15,261,090	Allegheny Ludlum Steel Corp.
78,105,122	74,157,804	6.69	6.85	5,225,418	5,076,959	Northwestern Steel & Wire Co.[10]
67,889,893	69,330,353	3.03	4.47	2,054,046	3,095,727	Alan Wood Steel Co.
130,473,207	105,173,925	7.76	7.14	10,119,998	7,504,889	Lukens Steel Co.
121,094,351	100,541,926	2.29	3.42	2,769,855	3,440,872	Copperweld Steel Co.[12]
95,340,258	88,650,577	11.88	11.45	11,329,508	10,151,363	Lone Star Steel Co.
62,226,543	66,509,030	6.17	6.14	3,838,646	4,086,071	Laclede Steel Co.
59,739,437	66,629,700	10.88	12.03	6,498,163	8,013,050	Keystone Steel & Wire Co.
42,657,749	46,703,332	6.46	5.98	2,756,655	2,793,574	Continental Steel Corp.
28,115,864	28,765,487	1.24	2.92	348,182	838,920	Atlantic Steel Co.
68,605,586	61,844,173	9.97	9.38	6,838,882	5,800,400	Carpenter Steel Co.
53,764,817	58,126,507	5.46	6.67	2,937,954	3,876,826	Universal-Cyclops Steel Corp.
47,642,446	50,092,013	3.85	4.49	1,831,952	2,250,944	Eastern Stainless Steel Corp.
26,581,025	23,156,558	10.19	10.39	2,707,995	2,405,001	Vanadium-Alloys Steel Co.[11]
24,326,370	24,871,245	4.37	6.15	1,061,979	1,529,505	Jessop Steel Co.
$14,912,113,325	$14,394,773,662	7.37	7.28	$1,099,716,473	$1,047,965,887	Totals (or averages)
83,885,112	....	3.65	....	3,062,998	....	Barium Steel Corp.[34]

Current Liabilities 1957	Current Liabilities 1956	Ratio of Current Assets to Current Liabilities 1957	Ratio of Current Assets to Current Liabilities 1956	Working Capital 1957	Working Capital 1956	
53,441,414	$722,191,907	1.90—1	1.84—1	$679,614,493	$603,739,028	United States Steel Corp.
37,398,414	392,712,169	2.55—1	2.74—1	676,639,252	683,826,330	Bethlehem Steel Corp.
30,977,780	137,769,347	2.62—1	2.78—1	212,213,811	244,937,412	Republic Steel Corp.
18,061,000	118,540,000	2.21—1	2.30—1	142,969,000	153,783,000	Jones & Laughlin Steel Corp.
91,174,616	105,637,806	3.20—1	3.09—1	200,886,825	220,825,291	Youngstown Sheet & Tube Co.
4,436,664	106,380,210	2.40—1	2.32—1	118,154,844	140,711,249	National Steel Corp.
9,668,221	116,700,328	3.21—1	2.64—1	220,084,967	191,325,287	Armco Steel Corp.
2,913,069	67,486,297	3.56—1	4.03—1	186,785,479	204,781,191	Inland Steel Co.
7,595,288	56,914,176	2.21—1	2.13—1	69,733,224	64,516,916	Colorado Fuel & Iron Corp.
5,340,626	41,060,843	3.45—1	3.04—1	86,725,179	83,717,097[7]	Wheeling Steel Corp.
4,441,237	26,110,564	3.63—1	2.34—1	38,051,019	35,115,566	Sharon Steel Corp.
2,889,440	27,971,580	2.61—1	1.95—1	36,918,415	26,535,972	McLouth Steel Corp.
5,373,300	31,195,091	2.11—1	2.70—1	61,394,801	53,140,686	Kaiser Steel Corp.
8,201,995	14,740,434	3.97—1	2.65—1	24,355,960	24,376,260	Detroit Steel Corp.
9,517,967	26,958,935	3.71—1	3.24—1	52,862,076	60,402,277	Crucible Steel Co. of America
0,053,326	21,802,363	2.60—1	2.81—1	32,070,254	39,476,945	Pittsburgh Steel Co.
7,702,157	24,283,959	2.84—1	2.52—1	32,577,303	36,838,542	Granite City Steel Co.
8,488,847	39,849,286	3.12—1	2.55—1	60,278,200	61,760,622	Allegheny Ludlum Steel Corp.
9,626,174	3,008,610	1.74—1	4.72—1	7,160,489	11,189,669	Northwestern Steel & Wire Co.[10]
8,137,886	9,063,097	1.82—1	1.81—1	6,677,753	7,306,359	Alan Wood Steel Co.
1,862,738	8,496,925	2.81—1	3.47—1	21,443,297	20,980,040	Lukens Steel Co.
2,916,128	15,415,901	2.66—1	2.06—1	21,413,518	16,266,620	Copperweld Steel Co.[12]
0,815,211	8,758,725	4.34—1	4.80—1	36,131,639	33,257,307	Lone Star Steel Co.
5,370,038	5,955,424	3.81—1	3.29—1	15,103,052	13,649,482	Laclede Steel Co.
5,324,241	8,581,109	1.31—1	2.28—1	4,752,201	10,942,937	Keystone Steel & Wire Co.
3,100,816	3,963,947	4.80—1	3.83—1	11,787,097	11,235,428	Continental Steel Corp.
4,434,046	5,470,655	1.96—1	1.72—1	4,266,855	3,951,147	Atlantic Steel Co.
1,350,217	10,931,793	2.71—1	2.45—1	19,427,153	15,797,779	Carpenter Steel Co.
6,683,858	10,162,002	2.54—1	2.00—1	10,325,225	10,200,953	Universal-Cyclops Steel Corp.
5,713,970	7,359,952	3.64—1	3.30—1	15,084,931	16,913,816	Eastern Stainless Steel Corp.
5,342,809	5,169,735	2.65—1	2.30—1	8,840,699	6,708,325	Vanadium-Alloys Steel Co.[11]
2,145,618	3,677,359	4.00—1	2.36—1	6,447,257	4,996,179	Jessop Steel Co.
0,499,111	$2,184,320,529	2.43—1	2.43—1	$3,121,226,268	$3,113,205,709	Totals (or averages)
7,275,454	....	3.93—1	....	21,327,740	....	Barium Steel Corp.[34]

[26] Includes set-asides of $2,260,000 in 1957 and $3,108,000 in 1956 for future income taxes.
[27] Excludes 80 shares in 1957 and 453 shares in 1956 in scrip.
[28] Includes set-asides of $2,388,000 in 1957 and $4,005,000 in 1956 for future income taxes.
[29] Steel operating rate adjusted.
[30] Plus stock dividend of 3 per cent.
[31] Reflects 3-for-1 stock split.
[32] Reflects 2-for-1 stock split.
[33] Includes set-asides of $3,950,000 in 1957 and $4,955,000 in 1956 for future income taxes.
[34] 1956 figures are not comparable because of a tax-free spin-off of subsidiaries not related to steel production.
[35] Plus stock dividend of 2 per cent.



Timetable for Growth

1924*	Whisky
1950	Sodium
1957	Zirconium
1958	Hafnium
1958	Titanium
1960	Columbium
1960	Tantalum

*Distilleries could still produce in prohibition—for storage or medicinal purposes.

Reduction of zirconium and other metals is studied in this Mallory-Sharon plant

From Whisky to Metals

That's the story of National Distillers, now a fully integrated metals producer through its tie with Mallory-Sharon. Further growth expected on basis of pilot studies

HOW DOES a whisky producer get into the metals field?

For National Distillers & Chemical Corp., New York, it was a natural result of diversification into chemicals.

In the years following World War II, Americans rang up record sales at the package liquor stores. In 1948, National (the country's second largest whisky producer) showed a net profit of $26.8 million. But the boom faded. Demand dropped as heavy new excise taxes pushed prices up. Profits hit a low of $11.7 million in 1952.

National's management realized that growth of the whisky business was based mainly on population growth, so it looked for ways to diversify. It picked chemicals because of potential and because initial investment was low.

Start—In 1948-49, National, at the urging of E. I. du Pont de Nemours & Co. Inc., decided to begin production of sodium. In 1950, the company found itself the largest sodium marketer, but the smallest producer. Most other makers had operations consuming the bulk of their output.

Problem: Get industry to use more sodium. The company began a research program which eventually led to development of a workable metal reduction process. Says Dr. Robert E. Hulse, executive vice president of National and general manager of the firm's U. S. Industrial Chemical Co.: "In the early days we tried with little success to interest metal producers."

This situation, backed by an Atomic Energy Commission contract, prompted National to go into production of zirconium sponge. "We felt we could do it because it was a chemical rather than metallurgical operation," explains Dr. Hulse.

National reasoned that to sell more zirconium, and ultimately more sodium, the price would have to come down. The firm was able to cut the cost of sponge in half, but fabricators were slow to make cuts in mill product prices.

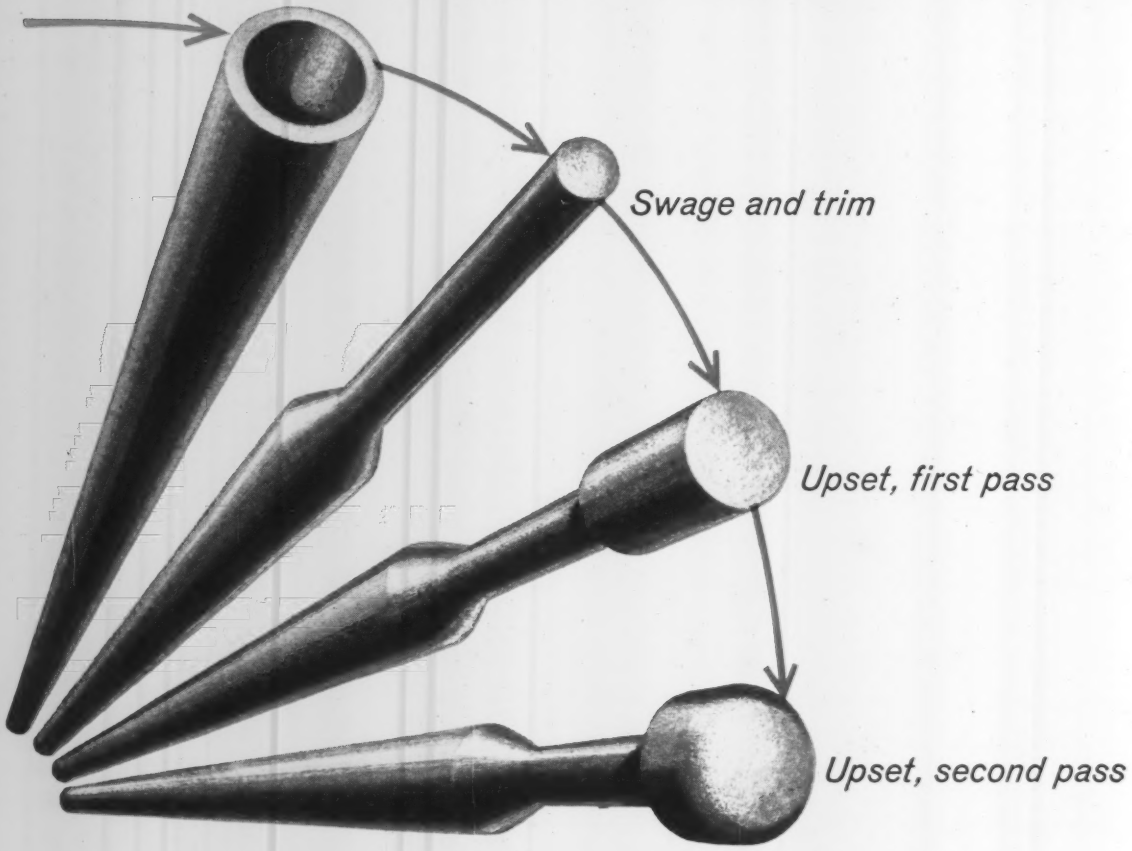
Integrated—Desire to have a fully integrated metals operation led to several multicompany tieups and to the formation early this year of Mallory-Sharon Metals Corp. (owned equally by National, P. R. Mallory & Co., and Sharon Steel Corp.).

This move combines National's (sponge) and the former Mallory-Sharon Titanium Corp.'s (fabrication) facilities and gives the new company:

- A zirconium sponge plant in Ashtabula, Ohio, with a capacity of 2 million lb per year (current operations are at an annual rate of 600,000 lb, but the firm expects full capacity production by midyear).
- A titanium and zirconium fabricating plant at Niles, Ohio.
- A zirconium melting plant at Ashtabula.
- Facilities to produce 40,000 lb of hafnium yearly (deliveries to begin this year).
- A potential output at the Ashtabula plant of 10 million lb of titanium a year. Production is scheduled to begin in May.

Sales — Currently, all zirconium

Start with OSTUCO TUBING



and end up with a 34% *saving*

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Chances are good that Ostuco Tubing is the right prescription for slashing your production costs, too. For expert advice, contact our nearest sales office or our plant at *Shelby, Ohio—Birthplace of the Seamless Steel Tube Industry in America.*

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1908 1958

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produced is being sold. The government is expected to take the hafnium output. Weak sister in the line is titanium, the company admits. Says William C. Greenleaf, manager of USI's metals development: "We still think the potential market for titanium is a good one. We believe an integrated company can stimulate demand by lowering prices and doing product development research."

Dr. Hulse predicts that within two years, Mallory-Sharon's sales of titanium and zirconium will hit $75 million yearly.

More—National also has several irons of its own in the fire. At Cincinnati, a pilot plant is being built to produce tantalum and columbium. Capacity will be 2000 to 6000 lb monthly, says Mr. Greenleaf. The company hopes to sell commercially by 1960.

Advanced studies on production of uranium and thorium are being conducted. The company is also interested in some of the rare earths, which have atomic energy applications and possible uses in the alloying of high grade steels.

Some laboratory work is underway on vanadium, molybdenum, beryllium, tungsten, and ductile chromium. Explains Mr. Greenleaf: "We believe the sodium reduction process can be used for any metal. We are trying to find which metals can be made cheaper or better."

Development—Early in the game, the company decided to set up a fast, mobile operation. Result: An organizational team developing metals and markets simultaneously.

In New York is a group of market research and engineering people. They begin research at project inception. Equipment needs, plant facilities, sales objectives, markets, and customers are determined. If the project doesn't appear feasible, it's killed early. If it looks promising, the company can move to production in a minimum of time.

When USI tackled zirconium, it did research and pilot plant work and began production, all within two and a half years. Industry average is seven years for development of new metals, says Dr. Hulse.

National's diversification evidently has paid off. Net profit hit $23 million last year, virtually double that of the lean years of 1952-54.

Economy Levels Out

Low point is here. Industry should prepare now for future uptrend in business, speakers agree

THE RECESSION bottomed out in the first quarter, but recovery might take a little longer than was originally thought: That's the consensus of speakers at the New York convention of the National Association of Waste Material Dealers Inc.

Low Point—Says Lewis Schellbach, vice president of Standard & Poor's Corp., New York: "The first quarter marks the low point in national production, but improvement will be discouragingly slow for some time. One reason for believing the worst is now being approximated is that inventory liquidation is as severe as it is likely to get—January reports suggest a $6 billion to $7 billion annual rate. Gross national production in the first quarter will probably be at an annual rate of around $429 billion, down almost $4 billion from last quarter's level."

Carl Gross, president of the Secondary Metal Institute, Chicago, believes the economy is now entering a leveling out period. He forecasts that increased business for secondary smelters in the second half will offset the first six months; in his opinion, the industry will fare better over the whole year than it did in 1957.

Scrap — Dealers won't have a good year since industrial activity will not pick up sufficiently in the first half to generate a large volume of scrap for the second, believes Henry Klingenstein, president of Keystone Metal Co., Pittsburgh. Mr. Klingenstein predicts the average producer price of electrolytic copper will be 26 cents a pound in 1958 (it's now 25 cents), and lead and zinc will move 1 to 2 cents above present quotations (lead is 13 cents a pound; zinc, 10 cents).

Realty Investments Gain

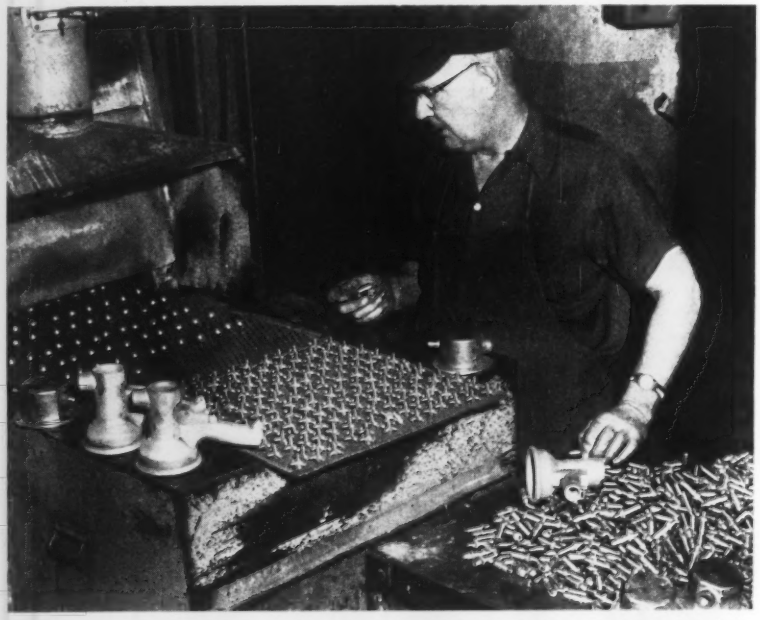
Announced investments in industrial land and buildings in the Chicago metropolitan area during February came to $20,136,000. The sum exceeds February totals in five of the last ten years.

Projects covered include construction of new industrial buildings, expansions, and purchases of land and buildings for industrial use.

CARGO CONTAINERS are manufactured to Defense Department specifications by Jeta Metal Fabricators Inc., Yonkers, N. Y. Container walls are made of Jones & Laughlin's 18 gage, corrugated, cold rolled sheets. The containers have a capacity of 295 cu ft and measure 8½ ft by 6¼ ft by 6 ft 10½ in.

COST CRISIS COMPETITION

This article is part of a campaign to help industry achieve lower unit production costs. The accompanying example and others to follow are samples of what the editors of STEEL are looking for in their nationwide search for companies that have brought about important cost savings through more efficient use of capital equipment. Does your company qualify? If so, enter the Cost Crisis Competition. Write to the Cost Crisis Editor, STEEL, Penton Bldg., Cleveland 13, Ohio, for your awards kit.



Copper brazing operations at Stewart-Warner's Alemite & Instrument Div.

How Engineers Can Beat the Cost Crisis

ENGINEERING MANAGERS are key men on any team trying to beat the cost crisis through more efficient use of equipment.

With basic responsibility for product design, they must be alert to cost-cutting opportunities in two areas: 1. Present products and facilities. 2. Future products and technological developments.

In product design, these must be considered:

- Can the part be produced profitably on present facilities?
- Should new equipment be purchased? Or is modification of present equipment more practical?
- Do economics dictate that the part be farmed out?

The best answer isn't always readily apparent. More often it involves team play among engineering, production, and whoever has the basic responsibility for equipment.

Modernize or Add Capacity?

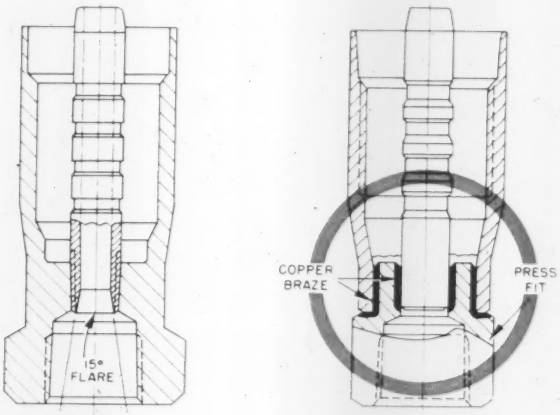
Here's a basic problem confronting many metalworkers. Higher capacity can bring down unit costs. But the approach isn't as simple as it sounds. You often hear: "We could cut part costs with a new machine, but we can't justify the expenditure because we wouldn't be able to keep the new machine (with its increased capacity) busy." Your engineering manager can help solve this one.

At Stewart-Warner Corp.'s Alemite & Instrument Div., Chicago, the increased capacity problem arose when manufacturing was considering buying equipment that was more automatic than what it was using. Says E. G. Wicklatz, manager of engineering: "We had a line of products utilizing forgings which required hand screw machine operations. By redesigning, we were able to convert many of the components to screw machine parts which could be made on our automatic equipment. Naturally, we didn't convert the part unless a savings could be realized."

Farm Out or Buy Equipment?

One puzzler in the make-or-buy question is: "Do we farm it out or buy new equipment to make it?" The engineering manager can again play a key role.

In designing its products, Stewart-Warner had to keep its basic facilities in mind — screw machines, stamping, diecasting. When a part required brazing, it was farmed out because S-W didn't have the facilities. The advantages of brazing led to the extension of its use and eventually to the question of investing $80,000 in a 100-kw electric brazing furnace. To justify the cost, Mr.



OLD METHOD

External piece of Stewart-Warner's hose connector had to be machined from brass. Internal piece was machined from steel tubing. Assembly was done by threading. Flaring of internal tube was necessary to gain seal.
Swaging was final step.

NEW METHOD

Three parts were machined from free cutting steel. Assembly was done by press fitting. Brazing and swaging followed.

SAVINGS

Costs were cut 50 per cent.

Wicklatz and his engineers studied all parts and components to determine which could be made better and more profitably by brazing.

Material savings were obvious. On one speedometer, savings on shaft ferrule material amounted to nearly 75 per cent. Once the designers got busy, labor saving became a big factor. Brazing gave them flexibility in designing better parts. S-W installed brazing facilities, and about 50 different parts were redesigned to take advantage of the technique. Today, the number runs to "several hundred."

Redesign for Economics

Hobbing was the traditional way of making propeller shafts at Evinrude Motors, Milwaukee. Evinrude's chief industrial engineer, W. E. Klein, checked into the possibility of cold forming splines on the shafts. Equipment was available, but the shafts had to be redesigned. Engineering was consulted to see if the redesign was practical. Splines originally had 30-degree pressure angles, with minor diameter fit. Redesigned for the cold forming technique, they now have a 45-degree pressure angle with major diameter fit and full fillets at the minor diameter. Cost reduction: 400 per cent.

At Rheem Mfg. Co., Chicago, the plant engineer is in charge of all equipment and its maintenance. He reviews all new products coming from research and development to determine whether they can be produced on present equipment, whether new equipment should be purchased, or whether the part should be contracted. To cut costs, he can initiate design changes involving products and manufacturing equipment.

On its hot water tank line, Rheem formerly arcwelded pipe fittings to the tanks. William Briggs, plant engineer, investigated possibilities of projection welding to cut costs. He and his staff came up with a design change which permitted the change in welding methods. Savings in direct costs amounted to nearly 80 per cent.

Norman Rise, vice president of engineering and manufacturing at Inland Steel Products Co., Milwaukee, emphasizes: "Cost cutting is most effective when the whole team is kicking the problem about—we even get sales in on our sessions. The problem often cuts across several areas."

Most executives stress another point: Don't assume that the competitor who is underselling you is shaving (or eliminating) his profits. If you look hard enough, you'll find a way to cut costs.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Bethlehem Is Optimistic

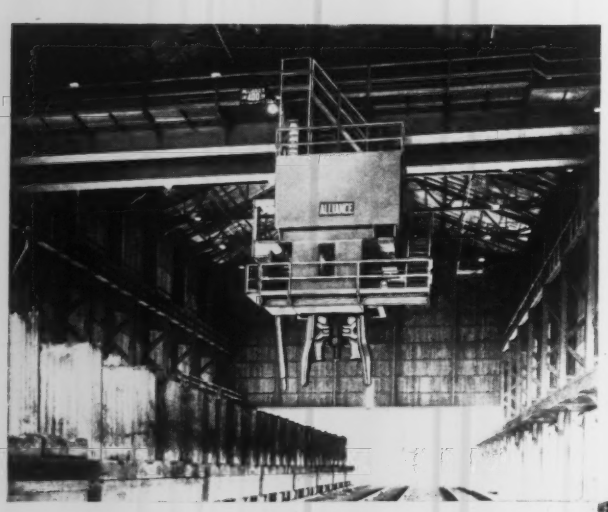
Long range prospects of Bethlehem Steel Corp. are good, says Arthur B. Homer, president, in his annual report to stockholders. But he warns: "If we are to progress soundly, it must be through increased productivity and not through the illusion of growth by inflation."

Last year, Bethlehem operated at 93.3 per cent of capacity, vs. the industry average of 84.5 per cent. Production was 19,123,201 tons of steel for ingots and castings, a Bethlehem record.

Construction during 1957 brought the company's annual rated steelmaking capacity to 23 million ingot tons as of Jan. 1, 1958, an increase of 2.5 million tons. Annual capacity of the Sparrows Point, Md., plant was boosted to 8.2 million tons.

Bethlehem's net income for 1957 was $191 million. Gross receipts of $2.6 billion were distributed this way: 41.9 per cent for materials, supplies, and services; 38.1 per cent for employment; 8.2 per cent for taxes; 4.3 per cent to stockholders; 4.2 per cent for depreciation, depletion, and amortization; 0.3 per cent for interest; and 3 per cent retained in the business.

During the year, Bethlehem distributed $111.8 million in dividends to stockholders, vs. $88.9 million in 1956. Employment costs were $1 billion, vs. $860.5 million in 1956.



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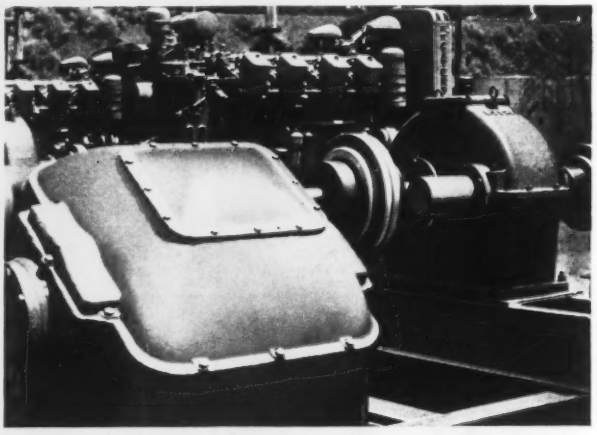
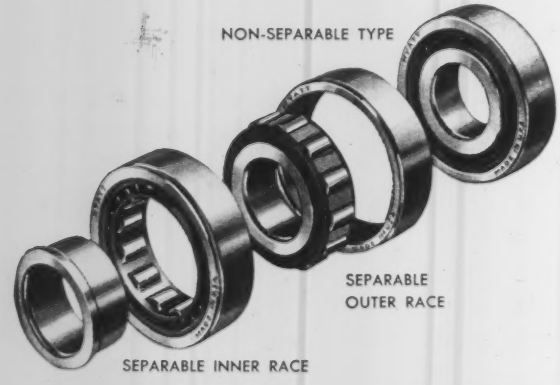
the more you need HYATTS . . . because you get more sheer load-carrying capacity with straight cylindrical roller bearings than with any other type. HYATTS give outstanding service in this 400-ton stripper crane.

THE HIGHER THE SPEED...

the more you need HYATTS . . . because carburized races, electronic control of eccentricity and internal clearances, and uncompromising final inspections assure smoother performance in speed reducers like this one.



THE MORE YOU NEED *Cylindrical* HY-ROLL BEARINGS

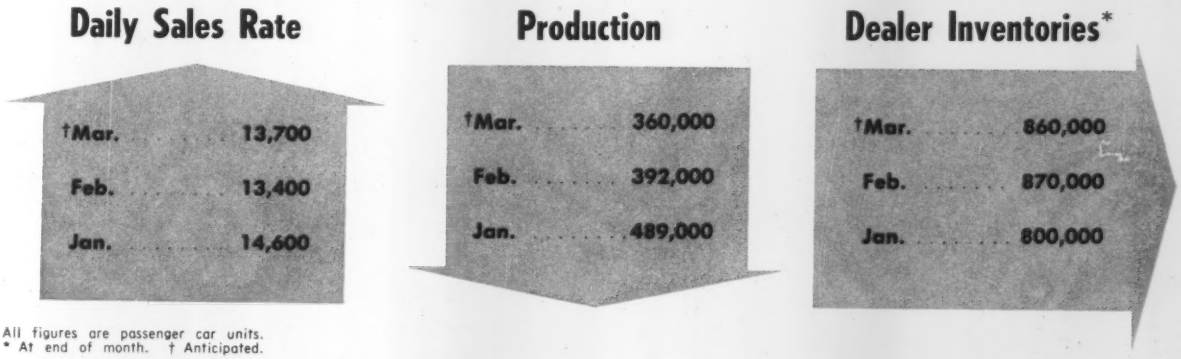


Loads are growing heavier, speeds are growing higher in many types of machinery today—and at the same time designers must often *reduce* overall size. Here's where HYATT Hy-Rolls have it all over limited-capacity bearings—especially when you eliminate either inner or outer races of separable HYATTS and operate the rollers directly on the hardened and ground shafts or housing bores. It's a smart way to save added space without sacrificing load capacity. Ask your nearest HYATT Sales Engineer for recommendations. Hyatt Bearings Division, General Motors Corporation, Harrison, N.J.; Pittsburgh; Detroit; Chicago; and Oakland, California.

THE RECOGNIZED LEADER IN CYLINDRICAL BEARINGS

1908–1958 GM FORWARD FROM FIFTY

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY



All figures are passenger car units.
* At end of month. † Anticipated.

Detroit Thinks Sales Upturn Is Near

First ten days of April should show autodom whether the corner has been turned. But higher sales won't bring about production hikes until inventories are whittled away

AUTODOM thinks its sales slump has leveled off, but the industry is waiting for mid-April reports to confirm its theory. A slowly increasing sales rate and production cuts have finally brought about a leveling of dealer inventories.

But the situation can be temporary. If sales don't pick up as anticipated, inventories will start inching up again, and Detroit can't cut production fast enough to keep dealer stocks steady.

Hopeful—Some signs of optimism are coming from the fact that several car divisions are now reporting ten-day sales figures. Up to the first of this month, American Motors Corp. has been the only company that has had sales to crow about. Mercury and Chrysler divisions are now getting into the act.

Mercury daily sales in the first ten days of March were at a 25 per cent higher rate than those in the last ten days of February, says Joseph E. Bayne, Lincoln and Mercury general sales manager.

The Big M doesn't indicate what the improvement means in units, but January registrations showed it was 1.5 per cent behind its year-ago registrations. Mercury's share of the January market slipped to 2.87 per cent from 2.9 per cent in December, 1957, and 4.4 per cent in the previous January. In the first two months of this year, Mercury built 23,725 cars, compared with 67,927 in the same period of 1957.

Chrysler — From the industry standpoint, the Forward Look has lost its magic, but Chrysler and Imperial cars show a 34.4 per cent increase in the first ten days of March over the last ten days of February. While it doesn't mean Chrysler is going to boom, it does indicate sales rates are picking up.

Productionwise, Chrysler built 26,861 cars in the first two months of 1957. This year it has turned out only 10,462. As March opened, Chrysler has been building just over 1000 units weekly. Imperial production is running about 335 cars a week.

Red Hot—While most of autodom is barely beginning to feel the breath of spring, AMC has been breezing right along. Roy Abernethy, vice president, auto distribution and marketing, reports that 3779 Ramblers were sold in the first ten days in March, against 2048 in the same period a year ago.

Rambler has sold 51,829 cars since the '58 models came out. In the same period last year, Mr. Abernethy's reports show the company had sold only 31,133. From a production standpoint, AMC now holds 3.5 per cent of the market, compared with 1.2 per cent a year ago.

Spurs — The industry isn't just hoping sales will pick up. Manufacturers are increasing sales contests and rebate plans to make sure dealers will get out and push. Dodge and De Soto have instituted dealer rebate programs for cars shipped before Dec. 1 and sold between Feb. 21 and Apr. 10.

The payoff is $75 for Dodge Coronets, $90 for Royals and station wagons. De Soto will pay dealers a flat $100 per car. The Ford Div. and AMC also are offering incentive programs, and Edsel has upped the take on its rebates.

In return, dealers in Akron and Detroit are copying the auto sales week started in Cleveland. Other cities are expected to follow suit. The Cleveland sellathon resulted in a 25 per cent sales increase in a week.

Output Off—No matter how well sales pick up, they'll only make a dent in dealer inventories. Weekly car production isn't expected to climb much over the 100,000 unit mark for several months—perhaps not until 1959 model buildups begin.

On the basis of the first two

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IF STUDEBAKER-PACKARD CORP.'S ASTRAL ever gets into production, power will come from ionic or nuclear forces which are converted into a jet thrust through a battery of tubes (astropods) at the rear of the vehicle. Several similar designs utilizing nuclear power are on automaker's dream boards

months of this year, market shares for each make of car are pretty well firmed up. They won't change much the rest of the model run.

Ford Motor Co., for example, has dropped from 30 per cent of the market last year to 28 per cent this year. Mercury has made the poorest showing (see Page 61), but Ford moved from 23.6 to 24.2 per cent.

General Motors has recovered its traditional half of the market, taking 56.2 per cent of the January-February output, against 47.1 per cent for the same period of 1957. Chevrolet is the big gainer, going from 22.8 per cent to 31.4 per cent. Buick has dropped from 8.2 to 6.9 per cent, and Oldsmobile has come up from 7.3 to 8.5 per cent. Pontiac is holding about even, and Cadillac is up slightly to just about 3 per cent.

Gloomy Future—The big loser is Chrysler. The corporation is taking 11.5 per cent of total output; a year ago it had garnered 20.3 per cent. Here's how Chrysler market shares compare with those in 1957:

	January-February Production	
	1958	1957
Plymouth	7.4%	10.5%
Dodge	1.8	4.5
De Soto	0.8	2.5
Chrysler	1.2	2.2
Imperial	0.3	0.6

That's the picture as Detroit holds its breath waiting for the spring rush to start. Automakers need all the sales they can get. The year was started with the usual optimism (6 million sales were predicted), but auto analysts moved their sights down to 5.8 million some time ago. Now they hope sales will wind up around 5.3 million or 5.4 million units; some privately admit 5 million may be closer to the mark.

S-P Cuts Losses

Studebaker-Packard Corp. reports it reduced 1957 losses to $11.1 million on sales of $213.2 million, compared with a $43.3 million loss in 1956 before special charges of $60 million on sales of $303 million.

S-P's current assets are $87.5 million; liabilities are $35.3 million. Working capital is $52.2 million, compared with $54.6 million in 1956. Harold E. Churchill, S-P's president, says the company had a relatively small operating loss during the last quarter of '57.

The firm doesn't say how many cars it has sold this year, but production figures show that at mid-March 5650 Studebakers and about 1000 Packards had been built Year-ago production figures in the first two and a half months came to about 13,000 vehicles. S-P's market share currently is 0.6 per cent, compared with 1 per cent last year.

T-Bird Claims Sales Boom

Ford's four-passenger Thunderbird has been the subject of much controversy since its introduction on Feb. 13, but the company feels the car will make good. A backlog of more than 7000 orders is on the books at Ford's Novi, Mich., plant where T-Birds are built.

The company says it is receiving advance orders at a rate 100 per day faster than it can build the cars even on current overtime production. Advertised delivered prices on T-Birds are running about $3630, but several auto auctions indicate they are selling for closer to $4200.

Exhaust Notes

- Thompson Products Co., Cleveland, is dickering with Georgia Institute of Technology for manufacturing rights on a fuel injection system developed by the school. It reportedly has a simpler and more effective design than present systems.
- Rumor has it that Ford will use semielliptical rear springs in combination with air bags on 1959 models. Also rumored—Lincoln will not have air springs in 1959.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	641,591
February	392,112	571,098
2 Mo. Total	881,469	1,212,689
March		578,826
April		549,239
May		531,365
June		500,271
July		495,629
August		524,354
September		284,265
October		327,362
November		578,601
December		534,714
Total		6,117,315

Week Ended	1958	1957
Feb. 22	89,977	138,938
Mar. 1	91,508	140,362
Mar. 8	83,892	140,161
Mar. 15	86,447	141,038
Mar. 22	83,182†	138,646
Mar. 29	82,000*	130,233

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

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1908–1958 GM FORWARD FROM FIFTY

ND NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

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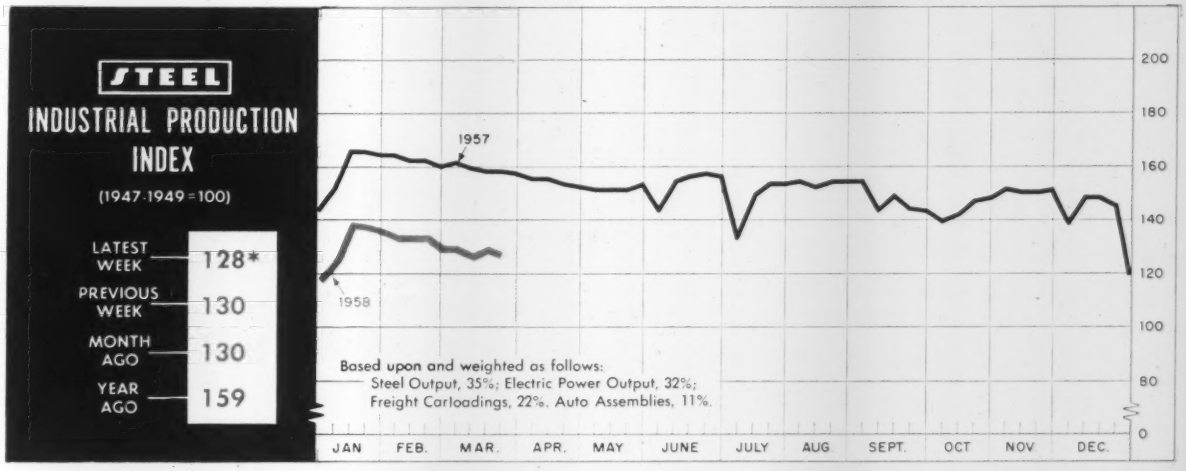

* Week ended Mar. 22.

Consumers Still in a Good Position To Buy

EARLY THIS MONTH, Sumner Slichter, one of the nation's top economists, told STEEL that he did not think the consumer would be as big a force in the resurgence from this recession as he was in 1954-55. One reason is that he's doing about all he can right now.

As Robert Briscoe, the former mayor of Dublin, Ireland, pointed out to a television audience in Cleveland: Even in the middle of a recession, America is still the wealthiest nation in the world; our consumers continue to maintain the highest living standards in the world. Evidence: Personal income is at an annual rate of $342 billion, just 1.5 per cent less than the record level of last August.

Full Pay Envelopes—Some segments of that total are not so impressive, but, nevertheless, they are high. For instance, in February a factory worker with three dependents earned an average of $73.71 net, down just 17 cents a week from the January figure. Over the year, that's a decline of $1.28 a week, or 1.7 per cent. The hourly rate in the metalworking industry has advanced 4.9 per cent during the 12 months, indicating that the cutback in takehome pay is the result of shorter hours. In the same time, total industrial production has declined almost 11 per cent.

What has hurt the consumer more than any wage decrease is the rise in the cost of living. The government's consumer price index has been climbing since August, 1956, and reached an all-time high of 122.5 (1947-49=100) last month. (See chart, Page 66.) This resulted in a further shrinking of the factory worker's buying power, which is down almost 5 per cent from what it was a year ago.

Higher Prices Coming — The wholesale price index is also showing persistent strength on the up side (see Barometers of Business below). Wholesalers are almost certain to pass some of their increased costs to retailers. The consumer can

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,363[1]	1,417	2,364
Electric Power Distributed (million kw-hr)	11,800[1]	11,860	11,723
Bituminous Coal Output (1000 tons)	7,560[1]	8,100	10,235
Crude Oil Production (daily avg—1000 bbl)	6,200[1]	6,257	7,818
Construction Volume (*ENR*—millions)	$278.3	$313.1	$375.9
Auto, Truck Output, U. S., Canada (*Ward's*)	107,731[1]	111,772	172,708
TRADE			
Freight Carloadings (1000 cars)	525[1]	539	686
Business Failures (Dun & Bradstreet)	336	358	301
Currency in Circulation (millions)[3]	$30.592	$30,641	$30,589
Dept. Store Sales (changes from year ago)[3]	−1%	+7%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$25,951	$22,626	$25,952
Federal Gross Debt (billions)	$275.4	$275.7	$274.8
Bond Volume, NYSE (millions)	$20.7	$23.6	$17.4
Stocks Sales, NYSE (thousands of shares)	11,316	12,007	8,061
Loans and Investments (billions)[4]	$89.4	$88.6	$85.7
U. S. Govt. Obligations Held (billions)[4]	$28.0	$27.7	$25.7
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	227.41
STEEL's Nonferrous Metal Price Index[6]	201.4	201.9	240.1
All Commodities[7]	119.7	119.5	116.9
Commodities Other than Farm & Foods[7]	125.9	125.9	125.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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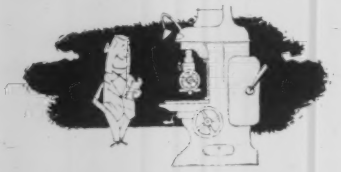

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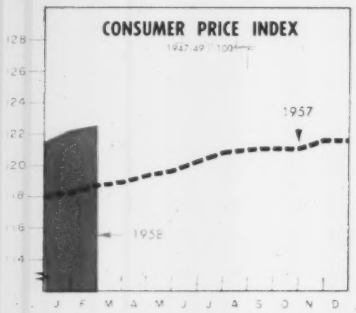
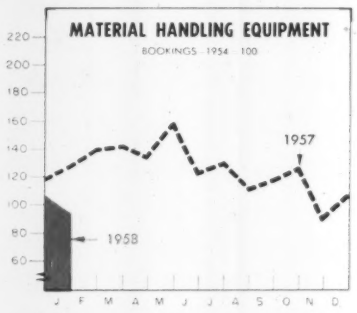
OF TOOL ENGINEERS

THE BUSINESS TREND





	1958	1957	1956
Jan.	122.3	118.2	114.6
Feb.	122.5	118.7	114.6
Mar.	....	118.9	114.7
Apr.	....	119.3	114.9
May	....	119.6	115.4
June	....	120.2	116.2
July	....	120.8	117.0
Aug.	....	121.0	116.8
Sept.	....	121.1	117.1
Oct.	....	121.1	117.7
Nov.	....	121.6	117.8
Dec.	....	121.6	118.0

U. S. Bureau of Labor Statistics.
Charts copyright, 1958, STEEL.

	1958	1957	1956	1955
Jan.	93.07	126.34	122.43	97.00
Feb.	.....	139.29	129.56	98.71
Mar.	.....	140.76	166.14	149.16
Apr.	.....	132.67	145.20	109.52
May	.....	157.95	155.53	110.50
June	.....	121.57	189.13	139.00
July	.....	128.31	165.50	111.76
Aug.	.....	110.09	168.70	106.20
Sept.	.....	116.79	130.35	136.80
Oct.	.....	124.80	143.38	123.52
Nov.	.....	87.80	138.50	118.09
Dec.	.....	105.65	117.76	139.85
Avg	.....	124.34	147.68	120.01

Material Handling Institute Inc.

expect another boost in the March cost of living index.

One thing that has kept total income high is the high rate of cash dividends by corporations. They came to $346 million in February, compared with $335 million in February, 1957. While manufacturing, railroad, and mining firms have taken a conservative dividend policy in the last few months, all other types of businesses have increased payments. (This parallels the recession, which has been confined almost wholly to metalworking manufacturers and associated industries.)

On the Limb — Looking into March, it appears that another slight crack might show up in the consumer's armor. Most guesstimates indicate that unemployment rose another 200,000 this month. Hours probably will show another slight drop. Corporate dividends may show a year-to-year decline. Partially offsetting the declines will be raises for about 100,000 workers (2 cents an hour) because of escalator clauses tied to the cost of living.

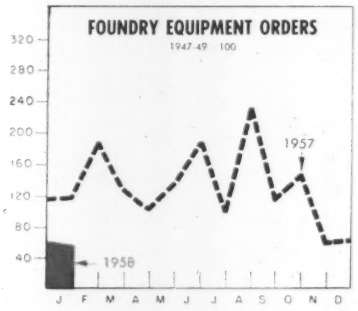
Total Trade Holds Even

Retail sales indicate the consumer is still spending at nearly the same rate he did last year when conditions were better. Department store sales so far this year have been about 2 per cent under those of the year-ago period through early March. Some experts claim the heavy snow storms in February and March are more responsible for the deficit than general business conditions. A pickup in trade should be noticeable in the figures for last week because of the early Easter shopping season this year. Unfortunately for metalworking, sales of durable goods have not held up as well as total trade.

Myron S. Gilbert, vice president of Federated Department Stores Inc., told a meeting of the National Industrial Conference Board that he expects retail sales this spring to hold to within 2 or 3 per cent of the year-ago level. "The fact that retail sales are holding up better than production means that eventually production will stop its decline, then turn up."

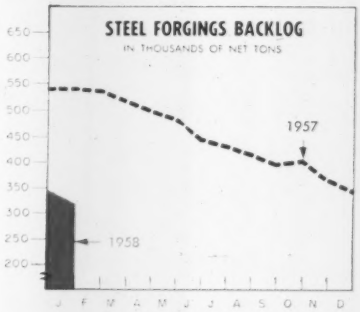
Index Leveling Off

There are growing signs that the recession has hit the low point, but there is no indication of an early upturn. For the first time since mid-November, STEEL's industrial pro-



	1958	1957	1956
Jan.	57.9	117.9	195.6
Feb.	....	188.4	169.0
Mar.	....	127.0	152.7
Apr.	....	101.1	135.2
May	....	136.2	207.0
June	....	187.5	156.7
July	....	98.6	110.3
Aug.	....	231.3	188.3
Sept.	....	113.9	114.7
Oct.	....	145.3	122.2
Nov.	....	59.6	121.0
Dec.	....	61.4	115.6
Avg	....	130.7	149.0

Foundry Equipment Mfrs. Assn.



	Shipments		Unfilled Orders	
	1958	1957	1958	1957
Jan.	108	148	318	537
Feb.	135	....	....	533
Mar.	146	....	....	517
Apr.	139	....	....	497
May	135	....	....	479
June	128	....	....	445
July	104	....	....	431
Aug.	115	....	....	417
Sept.	117	....	....	397
Oct.	126	....	....	401
Nov.	105	....	....	365
Dec.	99	....	....	343

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

duction index turned up slightly in the week ended Mar. 15—it stood at 130 (1947-49 = 100). The preliminary reading for the week ended Mar. 22 is 128.

Steel production is scheduled to total only 1,360,000 tons in the week ended Mar. 30. Automakers continue to cut production in an attempt to reduce the inventory burden of dealers. Freight carloadings and output of electric power will fluctuate within a narrow range during the next few weeks.

Business Community Grows

Despite uncertain conditions, the business community continues to grow, but the rate is slower than it was a year ago. Business failures in February totaled 1238, down seasonally from the preceding month's figure but 8 per cent above that of February, 1957. The annual rate of failures last month was 54 per 10,000 firms listed by Dun & Bradstreet Inc. This was well below the pre-World War II levels.

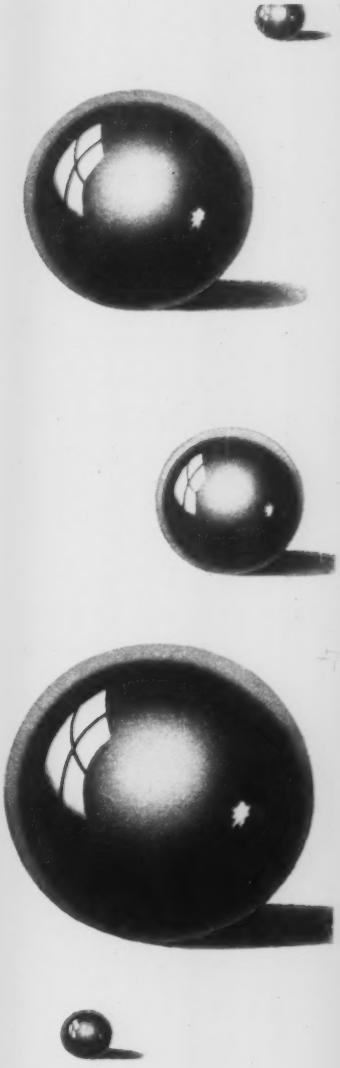
At the same time, 10,466 new businesses came into being, down seasonally from January. During the first two months of 1958, business incorporations numbered 23,546; failures came to 2517.

RR Decline Continues

Few business declines in the past year have been sharper than those of the railroad industry and its suppliers. Freight carloadings have been below year-earlier levels for 31 consecutive weeks. No letup is in sight during the first half. H. W. von Willer, president of Erie Railroad, predicts his road's loadings for this year will average 7 to 9 per cent lower than they were in 1957; most of the dropoff is expected in the first half. He looks for a pickup in the second half.

Freight car builders continue to cut heavily into their backlogs as orders dwindle to almost nothing. During February, the roads ordered only 294 cars for domestic delivery, compared with 6065 in the year-ago period. It was the worst February showing since 1949. Shipments dropped to 5316, but this still resulted in a significant cut to 43,750 units in the backlog as of Mar. 1. The figure a month earlier: 48,787.

At the same time, the backlog of locomotive units on order dropped to 273, compared with 867 a year earlier. Builders shipped 50 diesel-electric units in February, compared with 120 in January and 127 in the corresponding 1956 month.



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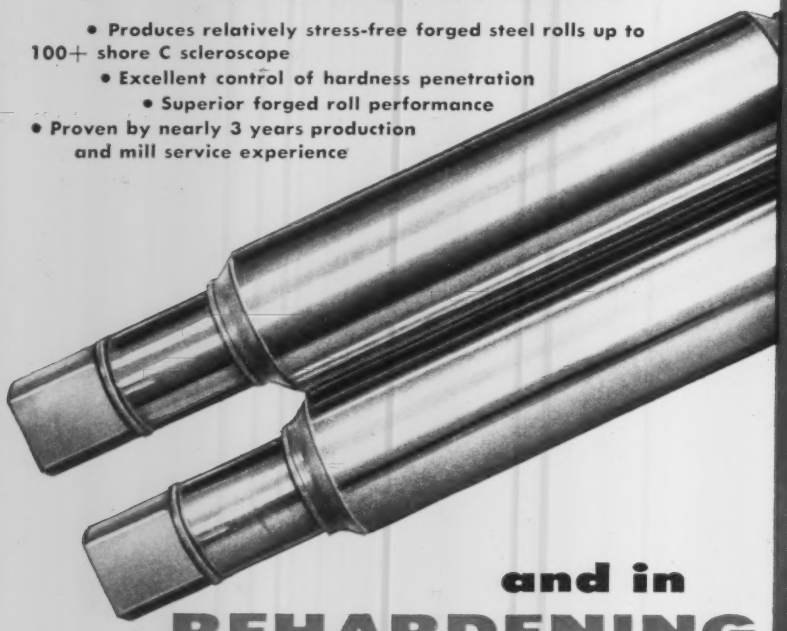

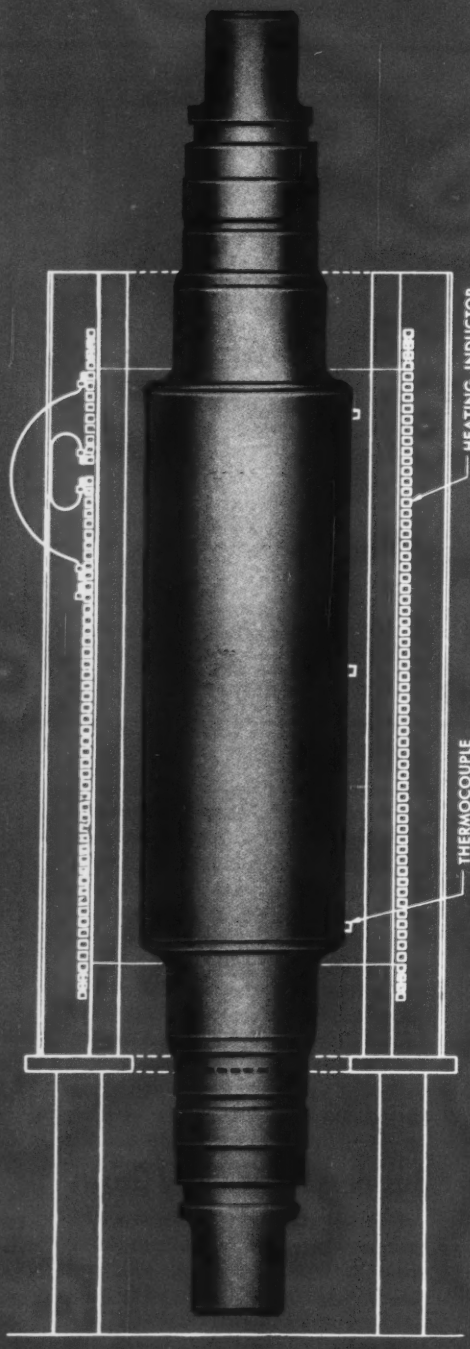

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GERALD A. WEIMER
U. S. Fabricators v. p.

JAMES V. ROUGHAN
Price Electric president

GEORGE G. KARIAN
Alan Wood sales position

ROBERT J. DILGER
Tube Turns purchasing dir.

Gerald A. Weimer was elected vice president - manufacturing, **United Steel Fabricators Inc.**, Wooster, Ohio. He was chief industrial engineer.

James V. Roughan was elected president, **Price Electric Corp.**, Frederick, Md. He was general manager.

Frank W. Collins was appointed assistant to the vice president-manufacturing, **Porter-Cable Machine Co.**, Syracuse, N. Y. **Edward O. Waters** was named production manager, heading purchasing, production planning, and inventory control.

Erwin E. Hirschberg was named sales manager, **Industrial Combustion Div.**, Eclipse Fuel Engineering Co., Rockford, Ill. He was eastern territorial manager.

John M. Welch was appointed director of field sales, **Olin Aluminum Div.**, Olin Mathieson Chemical Corp., New York. He was Chicago regional sales manager. **Devon E. Lemster** was made superintendent of production planning at Olin Aluminum's rolling mill, between Clarington and Hannibal, Ohio.

Frank Kaman was appointed chief air tool engineer; **Peter Rebechini**, chief electric tool engineer; **James A. Perham**, chief product engineer of **Thor Power Tool Co.'s** Aurora, Ill., Works. **Rex Beach** succeeds Mr. Rebechini as director of the Thor engineering laboratory. The new chief engineer positions co-ordinate supervision of the engineering department at the Aurora Works.

George G. Karian was made manager of iron powder sales for **Alan Wood Steel Co.**, Conshohocken, Pa. He was with F. J. Stokes Corp., serving as product manager in charge of sales of powder metal and industrial compacting presses.

John A. Kirk was appointed vice president - production, **American Coils Co.**, Farmingdale, N. J. He was assistant to the executive vice president.

Carl S. Saltzman was named manager of the new **Control Systems Co.**, division of Hancock Industries, Jackson, Mich.

Alvin R. Deas was made manager of **General Electric Co.'s** semiconductor rectifier manufacturing plant at Clyde, N. Y.

B. M. Ashbaucher was made Chicago district sales manager, **American Steel & Wire Div.**, U. S. Steel Corp. He was district manager of sales in Dallas.

J. M. Cook was appointed vice president-marketing; **P. S. Jones**, senior vice president at **Cutler-Hammer Inc.**, Milwaukee. Mr. Jones, former sales vice president, will retire at the end of the year. Mr. Cook's post, a new one, includes sales duties.

Walter E. Templer was promoted to purchasing agent, mill and mine supplies, for **Jones & Laughlin Steel Corp.**, Pittsburgh. He succeeds **A. Norval Johnston**, who retired in February as assistant vice president-purchasing.

Robert J. Dilger was made director of purchases, **Tube Turns Div.**, Louisville, National Cylinder Gas Co. He has been in charge of purchasing for Girdler Co., a division, and for Tube Turns since 1942.

Harry Carloss was elected executive vice president of **Deming Co.**, Salem, Ohio. He is succeeded as vice president-sales by **Rolland Webber**, who was factory sales representative in the Detroit area. **George Emeny** was elected vice president, continuing as manager of engineering sales.

H. M. Fisher joined **Biggs Foundry & Fabricating Co.'s** Akron plant as vice president in charge of engineering and production. Before joining Biggs, subsidiary of Union Spring Co., Mr. Fisher was with Firestone Tire & Rubber Co.'s mechanical engineering laboratory.

Clifford W. Bishop was appointed sales manager, analytical and control instrument division, **Consolidated Electrodynamics Corp.**, Pasadena, Calif. He is succeeded by **Robert D. Enochs** as manager of the company's Dallas district sales office.

W. H. Heath was made assistant general sales manager, **Disston Div.**, Philadelphia, H. K. Porter Company Inc., in charge of hardware and industrial sales. He was manager, hardware products, and is succeeded by **C. Earl Weber. E. H. Biemuller Jr.**, former manager, industrial products, was made regional sales manager-midwest area, with headquarters in Chicago. **V. J. Miller** will be assistant regional sales manager

CHARLES H. JOHNSON FRANK A. ROYCE BYRON T. MORRIS

Republic steel and tubes division appointments

there. **R. C. Williams** was made manager, industrial products.

Dr. W. A. Raczynski fills the new post of director of research and development at **Ditto Inc.**, Chicago.

Kenneth H. Meyer, director of engineering, **C. B. Hunt & Son Inc.**, Salem, Ohio, was elected vice president.

Robert T. Rinehart was made eastern regional sales manager, **K. W. Battery Co. Inc.**, Skokie, Ill.

William N. McArdle was made Philadelphia district sales manager, **Superior Steel Div.**, Copperweld Steel Co.

Curtis Altbaier was made manager, special machine tool sales; **Carl Schonhoft**, manager, grinding machine sales, **Cincinnati Milling & Grinding Machines Inc.**, sales subsidiary of Cincinnati Milling Machine Co. **Carl Stugard**, vice president, continues as manager, special machine tool division.

Charles H. Johnson was appointed superintendent of the Cleveland plant of **Republic Steel Corp.'s** steel and tubes division. He succeeds **Frank A. Royce**, appointed division welding engineer. Mr. Johnson was superintendent of the Elyria, Ohio, plant of the division, and is succeeded by **Byron T. Morris**, former assistant superintendent.

Sam M. Kennard III was elected a vice president, **American Air Filter Co.**, Louisville. He is president of the subsidiary, Kennard Corp.

David White Instrument Co., Milwaukee, elected **A. F. Waldenberg** vice president-marketing. He was general sales manager.

Fred F. Florence was elected chairman of **Lone Star Steel Co.**, Dallas. He succeeds **C. E. Owen**, resigned.

Carpenter Steel Co., Reading, Pa., appointed **Neil J. Culp** supervisory metallurgist - alloy development; **Samuel M. Purdy**, supervisory metallurgist-metallography.

M. Claude Schuler was made sales manager, **Bostitch Inc.**, East Greenwich, R. I. He was manager of Bostitch-Atlanta Inc., branch office serving six southern states. Filling a new post of product research manager is **Loren K. Grimes**, former manager of Bostitch-Baltimore Inc. **Arthur P. Collins** was named to the new post of director of foreign sales. He was head of Bostitch-Eastern Inc.

Lew Murray was made manager of the contract department for **Clearing Machine Corp.**, division of U. S. Industries Inc., Chicago. He was supervisor of the methods department.

James R. Douglas was made West Coast industrial and commercial sales manager of **Campbell Chain Co.** He is in Sherman Oaks, Calif. He was with Permacel Tape Corp.

Archer W. Brown was promoted to chief mechanical engineer, **American Hoist & Derrick Co.**, St. Paul. He was assistant mechanical engineer. **Richard G. Lynn** was made chief electrical engineer.

Michael P. Komar was made general sales manager for the new engineered products sales division, **Inland Steel Products Co.**, Milwaukee. **Gordon W. Matthews** heads the new commodity and metal lath product sales division.

Capt. Howard T. Orville, ret., former chief aerologist for the U. S. Navy, becomes vice president at **Beckman & Whitley Inc.**, San Carlos, Calif.

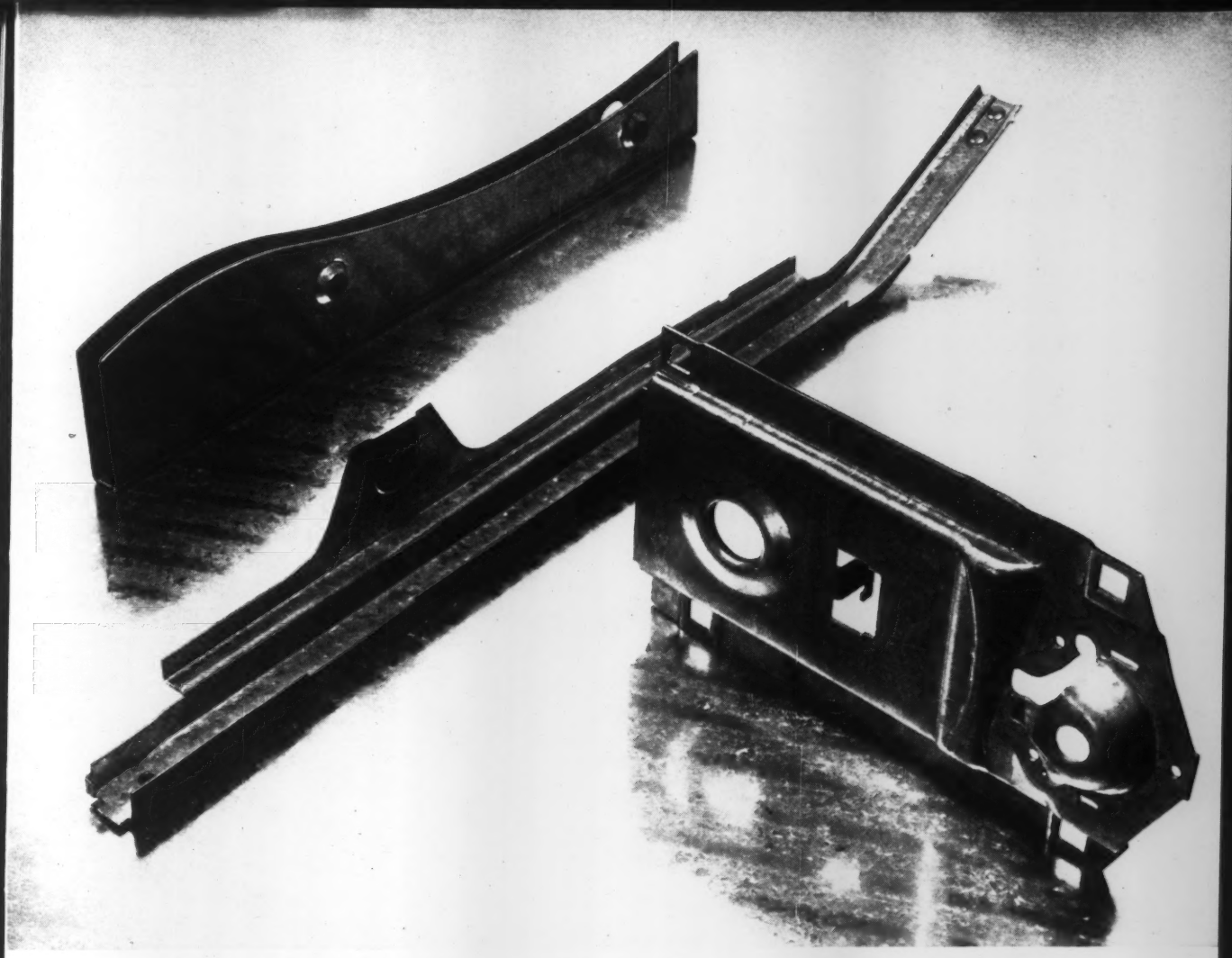
J. Kenneth Sloan was made national sales manager-pumps for **Hupp Aviation Co.** He has headquarters in

CURTIS ALTBAIER CARL SCHONHOFT

Cincinnati Milling Machine sales posts

NEIL J. CULP SAMUEL M. PURDY

Carpenter Steel promotes metallurgists



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Dodge Mfg. chief eng.

STANLEY J. RENTON
Interstate Drop Forge supt.

ELMER J. LELL
Colmonoy v. p.-operations

ANSON W. KRICKL
Badger Mfg. v. p.

FREDERICK A. DUDDERAR
gen. supt. Clairton Works

ALFRED S. FUREDY
Hassall production mgr.

Chicago. He was national sales manager, pump division, Yale & Towne Mfg. Co.

Anson W. Krickl, manager of the manufacturing division of **Badger Mfg. Co.**, Cambridge, Mass., was elected a vice president.

Frederick A. Dudderar was appointed general superintendent, **Clairton Works**, Clairton, Pa., U. S. Steel Corp. He succeeds **David P. Finney**, who retires Apr. 1. Mr. Dudderar was assistant general superintendent.

Gunite Foundries Corp., Rockford, Ill., named **William H. Shinn** assistant to the president; **Harry F. Forbes**, sales manager, industrial products; **S. A. Malthaner**, director of engineering for all company products.

Victor H. Lanahan was appointed manager of ring sales for **Heppenstall Co.**, with headquarters at the ring plant, Indianapolis. He succeeds **Charles B. Cobun**, appointed assistant to the director of sales.

Alfred S. Furedy was made production manager of **John Hassall Inc.**, Westbury, N. Y. He was director of manufacturing at Heli-Coil Corp.

Douglas Stockham succeeds his brother, the late **Herbert C. Stockham**, as chairman of **Stockham Valves & Fittings**, Birmingham. **Herbert C. Stockham Jr.** was elected vice chairman. **L. N. Shannon** and **R. L. Stewart** were elected senior vice presidents; **C. H. Denicke**, vice president-sales.

Barney A. Monaghan Jr. was made executive vice president, **Vulcan Materials Co.**, Birmingham.

Roy Blasiola was made manager of **Chrysler Corp.'s** stamping plant, Twinsburg, Ohio. He is succeeded as manager of the Mack Avenue stamping plant in Detroit by **Walter B. Connolly**, who was manager of the Outer Drive stamping plant, Detroit. Mr. Connolly is replaced by **Wilfred T. Hanlon.**

Walter S. Wainright was made assistant district manager at Houston for **Republic Steel Corp.**

Jackson Chung was appointed chief engineer, **Dodge Mfg. Corp.**, Mishawaka, Ind. Former chief development engineer, he succeeds **Alex T. Bodle**, now consulting engineer. **Donald P. Lower** advances from assistant chief engineer to manager of engineering.

Stanley J. Renton was made plant superintendent of **Interstate Drop Forge Co.**, Milwaukee.

Elmer J. Lell was made vice president in charge of **Colmonoy Div.** operations, Wall Colmonoy Corp., Detroit. He was vice president-sales for the division.

Russell E. Ramser Jr. was made superintendent; **Kenneth N. Baker**, assistant to superintendent for centrifugal compressor manufacturing, **Cooper-Bessemer Corp.**, Mt. Vernon, Ohio.

L. S. Starrett Co., Athol, Mass., appointed **Reginald E. Brackett** assistant sales manager. He continues in charge of the dial gage division.

Faust R. Gonsett was appointed president; **J. F. Cocks**, general manager of Young Spring & Wire Corp.'s **Gonset Div.**, Burbank, Calif.

J. Edwin Richards was elected secretary and corporate counsel of **Universal-Cyclops Steel Corp.**, Bridgeville, Pa.

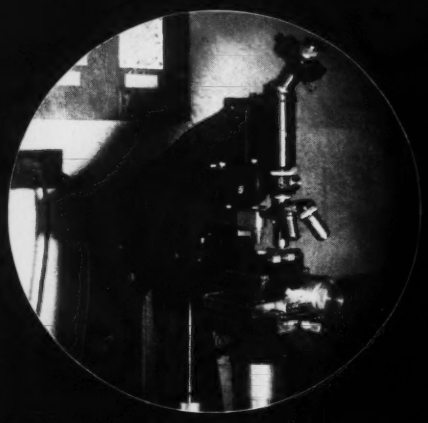
Mercoid Corp., Chicago, elected **J. F. Chambliss** president and treasurer; **Hugh Courteol**, chairman; **W. E. Jones**, vice president-sales; **W. L. Colterjohn**, vice president; **W. K. Stauffer**, vice president-eastern area; **R. F. Fisher**, vice president-western area; **P. J. Provost**, vice president-industrial division.

Ira F. Gilliatt was elected president, **Conveyor Specialty Co.**, North Quincy, Mass., succeeding **E. D. Gilliatt**, retired. **Richard E. Vergobbe** was named sales manager.

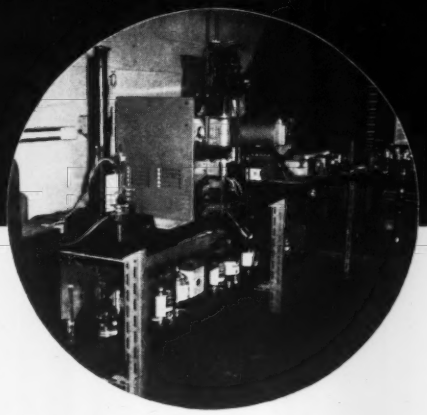
B. E. Petry was named chief engineer, oven division, **Baker Perkins Inc.**, Saginaw, Mich.

D. Santini, formerly manager of equipment engineering, was named manager of elevator engineering, **Westinghouse Electric Corp. H. V. McCormick**, formerly manager of apparatus engineering, was made manager of special products engineering, elevator division.

CLEVELAND is the name and the place for ABRASIVES



a fine laboratory guarantees a fine product



We have placed a lot of earnest dollars on the line to develop outstanding laboratory facilities. This investment has been deliberate, because we have a reputation for top-quality, uniform metallic abrasives, and we want to maintain it!

Out of these facilities have come consistently rigid production standards which meet our own, as well as SAE, specifications. Also out of these facilities have come our two latest *new* products . . . "A" shot and grit, a controlled analysis chilled iron having extremely long life; and *Pearlitic Malleable* shot and grit.

These two new metallic abrasives, combined with our regular line of Persuasive Abrasives, give you a complete range and availability of product to fit your cleaning or peening requirements.

Paletized, banded, covered . . . any way you wish.

Write for our catalog or call in our nearest representative to discuss the Cleveland line further.

CLEVELAND ABRASIVES

1. Realsteel Shot and Grit 2. Pearlitic Malleable 3. Normalized
4. "A" Iron 5. Hi-Strength "B" 6. Chilled Iron 7. Drawn Steel

World's Largest Producer of Metallic Abrasives

CLEVELAND *metal abrasive co.*

General Office: 888 East 67th Street • Cleveland 8, Ohio

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Interstate Drop Forge Company—

20 Years a Cities Service Customer and Still Forging Ahead!

The modern way to cut a die is typified by die sinking machine, one of many at Interstate Drop Forge Company. All die sinking machines are lubricated by Cities Service lubricants.

With production running at roughly 1000 tons per month, Interstate Drop Forge Company of Milwaukee is one of the largest forging concerns in the Wisconsin area and growing all the time.

An integral part of this growth story, Cities Service is proud to have filled Interstate's lubrication needs for the past 20 years.

Drop hammers . . . helve hammers . . . upsetters . . . forging rolls . . . shapers . . . automatic metal saws. These are but a few of the diversified machines lubricated by specially tailored Cities Service oils and greases.

Actually, in a plant of this type with so many differing pieces of machinery, it would be possible to have as many as 25 different lubricants. But, Interstate, with the aid of their Cities Service Lubrication Engineer has been able to standardize on twelve Cities Service lubricants.

Streamlining . . . standardizing . . . improving. These are some of the services a Cities Service Lubrication Engineer can render for your operation, too. Ask him to make a free lubrication survey of your plant. Call the nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Supplier Goes South

Division of U. S. Steel enters area with warehousing operation at Birmingham, starting May 1

U. S. STEEL Supply Div., U. S. Steel Corp., will start its first steel warehousing operation in the South at Birmingham on May 1. The division is the second largest warehousing organization in the U. S.

Steel Supply will use the former strapping products warehouse of Gerrard Steel Strapping and the former wire rope and stainless steel warehouse of U. S. Steel's Tennessee Coal & Iron Div. Gerrard, formerly a separate division, recently became part of the supply division.

A complete warehousing service, including all general line steel products, will be available.

Supply Div. — The Birmingham warehouse will be the 19th to be operated by the division. It has warehouses or sales offices in 16 states.

Explaining the southern move, John H. Morava, division president, says: "In recent years, the South has advanced rapidly in both consumption and production of steel products. We can see continued and accelerated growth here, not only in steel but in many industry phases.

"We chose Birmingham as our site because it is recognized as the industrial center of the Southeast and because U. S. Steel's Tennessee Coal & Iron Div. is there."

In addition to TCI products, the warehouse will handle special products from other units of U. S. Steel. Included will be such items as stainless steel, cold finished bars, and mechanical tubing. A small percentage of the stock will be supplied by other metal manufacturers.

Company Reorganizes Div.

Hanson - Van Winkle - Munning Co., Matawan, N. J., manufacturer of anodizing and electroplating systems, reorganized its engineering division. The company described the changes as "reflecting a basic approach to product and systems research and development." It will place greater emphasis on developing new methods in the anodizing and electroplating fields.

Increased research into new products and equipment is also being planned.

AAR To Build New Lab

The Association of American Railroads will build a fourth laboratory building in 1959 or 1960 in its research center at the Illinois Institute of Technology, Chicago. It will have an electronics lab and room for a nuclear reactor.

Acquires Patent Rights

Chromalloy Corp., White Plains, N. Y., has acquired from Metallic Surfaces Research Laboratories Ltd., England, the exclusive rights for the U. S. and Canada to new metallic diffusion processes and techniques and to U. S. patents for which applications will be made.

Gets $8 Million Contract

Convair Div., General Dynamics Corp., has been awarded an $8 million contract by the Navy for pilot line production of Tartar guided missiles. The Tartar, newest and smallest of the Navy's surface to air missiles, is designed for use from ships as small as destroyers. Its range is about 10 miles.

Orders 44 Miles of Tube

Mallory - Sharon Metals Corp., Niles, Ohio, is working on a huge order for zirconium tubing. Commonwealth Edison Co.'s Dresden nuclear power station near Chicago needs nearly 44 miles of reactor grade tubing 9/16 in. in diameter with 1/32 in. walls. General Electric Co.'s atomic power equipment department, San Jose, Calif., is designing and building the station for Commonwealth.

Cutler To Consolidate

Cutler-Hammer Inc., Milwaukee, plans to acquire assets and business of Airborne Instruments Laboratory Inc., Mineola, N. Y. Agreement terms call for a share-for-share exchange of common stock. About 200,000 shares of Airborne and 1,320,000 shares of Cutler-Hammer stock are outstanding. It is expected that Airborne will be made a Cutler division.

Oliver To Close Plant

Oliver Corp.'s Plant 2, South Bend, Ind., will close soon. One of ten plants owned and operated by the Chicago firm, South Bend 2 is primarily a feeder plant producing parts for assembly of farm machinery and industrial crawler tractors built elsewhere by Oliver. Reassignment of the plant's production is the result of studies on feasibility of consolidating some of Oliver's operations.

To Make Guidance System

American Bosch Arma Corp., Hempstead, N. Y., has signed a $140,357,000 research and development contract with the Air Force to provide inertial guidance systems for the Titan intercontinental ballistic missile.

Enameling Steel in Coils

Volume production of normalized enameling steel in coil form has been started at Irvin Works of U. S. Steel Corp., Dravosburg, Pa. Production of enameling steel was previously limited to cut sheets.

Production is continuous, utilizing two uncoilers, continuous welding equipment, a gas fired heating furnace, a pickling line, scrubbing and drying facilities, a recoiling unit, and shearing facilities.

USS Vitrenamel is produced in coils from 16 to 22 gage, 24 to 60 in. wide and up to 50,000 lb coil weight.

NEW PLANTS

Arrow Brands Inc., a subsidiary of Reynolds Metals Co., will build a 45,000 sq ft plant in Torrance, Calif., to produce aluminum foil.

Linde Co., division of **Union Carbide Corp.**, completed an oxygen producing plant to supply oxygen to Pittsburgh Steel Co.'s Monessen, Pa., plant. The plant is on

property leased from Pittsburgh Steel, but is owned and will be operated by Linde.

Construction has been started on Plant No. 3 of **United States Chemical Milling Corp.**, Manhattan Beach, Calif. The plant will have 50,000 sq ft and will house facilities of USCM's Missile-Air and Hydro-Metal Spinning Corps.

Kaiser Aluminum & Chemical Corp. completed an $8 million caustic-chlorine plant at Gramercy, La.

W-K-M Div., ACF Industries Inc., will open a gray iron and steel foundry in November near Richmond, Tex.

Cleveland Crane & Engineering Co. began construction of an 11,400 sq ft research and development building at Wickliffe, Ohio. Completion is scheduled for June.

Central Screw Co.'s western division will occupy a new 20,000 sq ft Los Angeles plant in April.

Valley Aluminum Co., Fresno, Calif., has completed a new 12,000 sq ft plant. The firm produces aluminum boats, refrigerated truck bodies, and specialty items.

General Electric Co. will begin building a new plant near Phoenix, Ariz., in May. The plant will be the permanent home for the company's computer department.

Wheeling Corrugating Co., a subsidiary of Wheeling Steel Corp., has purchased a seven-acre tract at Southampton, Pa., for construction of a new plant to produce culverts.

ASSOCIATIONS

Metal Lath Manufacturers' Association, Cleveland, elected these officers: President, L. C. Hollerbach, manager, building material sales, Wheeling Corrugating Co., Wheeling, W. Va.; vice president, G. W. Matthews, general marketing manager, metal lath and commodity products division, Inland Steel Products Co., Milwaukee.

Foundry Educational Foundation, Cleveland, elected these officers: President, Frank X. Bujold, Ford Motor Co.; vice president, Frank G. Steinebach, editor of *Foundry;* secretary, W. B. Bishop, Archer-Daniels-Midland Co.; treasurer, E. M. Knapp, Ferro Machine & Foundry Inc.

Steel Founders' Society of America, Chicago, elected these officers: President, Ross L. Gilmore, president of Superior Steel & Malleable Castings Co., Benton Harbor, Mich.; vice president, B. P. Hammond, Foundry & Mill Div., Blaw-Knox Co., Pittsburgh; treasurer, R. G. Parks, treasurer of National Malleable & Steel Castings, Cleveland. Re-elected staff officers include F. Kermit Donaldson, executive vice president; Charles W. Briggs, technical and research director; George K. Dreher, market development director; and Erwin Dieckmann, assistant secretary.

NEW OFFICES

Jones & Laughlin Steel Corp. established a sales department suboffice in Dayton, Ohio. It is in a new building at 333 W. First St. Walter E. Hulse and Hugh F. McCarley are resident salesmen.

Flexonics Corp., Maywood, Ill., opened its Santa Ana Div. and western regional sales offices Mar. 21. They are at 3324 W. Delhi Rd., Santa Ana, Calif.

General Alloys Co., Boston, manufacturer of high alloy heat and corrosion resistant castings and fabrications, appointed **National Furnace Sales & Service Inc.**, Bell, Calif., engineering representatives in California.

S. L. Cooper Co., Washington, has opened a Yale industrial lift truck sales and service center in Norfolk, Va.

Buhr Machine Tool Co., Ann Arbor, Mich., opened a Detroit sales office. L. Bruce Mather and Fred N. Martin Jr., are in charge.

CONSOLIDATIONS

Virginia Metal Products purchased patents and machinery of **Metlwal Div., Prosperity Co.**, in Syracuse, N. Y. Virginia Metal will continue production in the plant formerly occupied by Metlwal.

Stone & Webster Engineering Corp., Boston, acquired **Associated Nucleonics Inc.**, Garden City, N. Y., which does nuclear research and development.

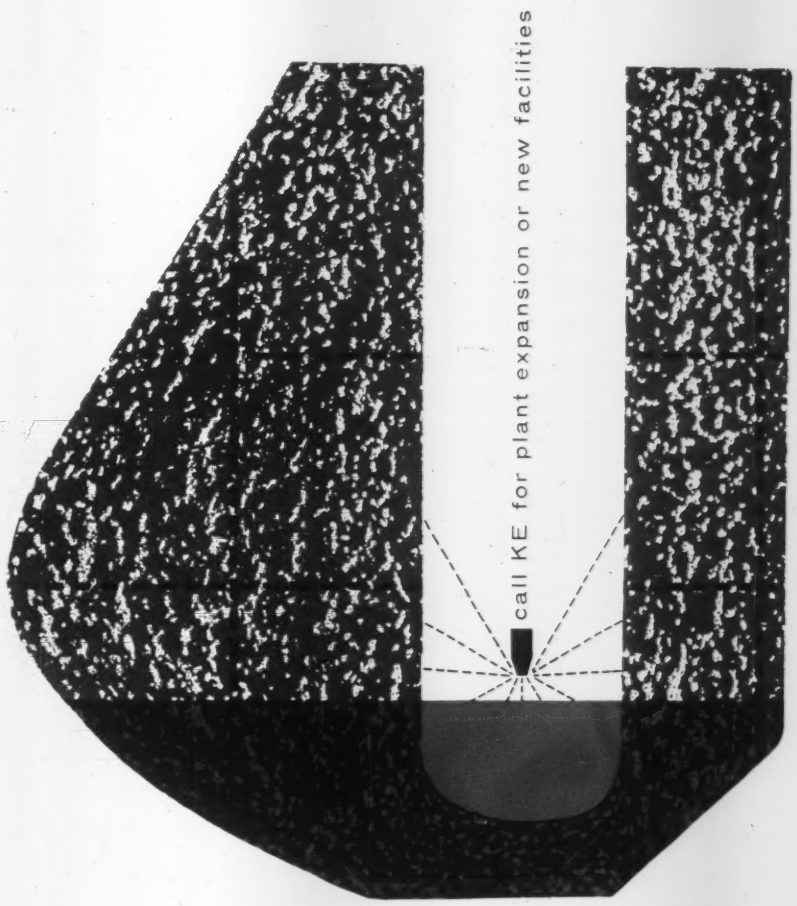
Merger of **Wayne Pump Co.**, Salisbury, Md., and **Symington Gould Corp.**, Depew, N. Y., is completed. The consolidated company is named Symington Wayne Corp.

Hoover Ball & Bearing Co., Ann Arbor, Mich., acquired the ball bearing business and certain assets of the **Ahlberg Bearing Co.**, subsidiary of Maremont Automotive Products Inc., Chicago. Machinery will be moved to Hoover's new plant near Ann Arbor.

Graham Engineering Research Inc., Milwaukee, Wis., purchased welding business of **Milwaukee File Co.** The company will specialize in welding, fabricating, flame cutting, and research in the heat treating and plating fields.

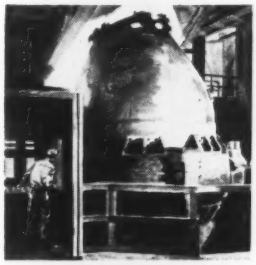
Dresser Industries Inc., Dallas, manufacturer of equipment for the oil, gas, and chemical industries, filed a registration statement with the Securities & Exchange Commission in connection with a proposed offer of its common stock in exchange for the common stock of **Elgen Corp.**, Dallas. Elgen is principally engaged in electrical logging of wells.

Pheoll Mfg. Co., Chicago, purchased all capital stock of **Tubing Seal Cap Inc.**, San Gabriel, Calif. Tubing Seal Cap makes precision metal stampings and a one-piece metal doorknob.



INGENUITY

has made KE the experienced leader in L-D Process Steel



L-D process plant similar to that now being installed by KE at a major eastern steel plant.

Design and construction of over 2,000,000 tons of oxygen steel making capacity. Intimate familiarity with oxygen steel technology in all parts of the world. A pioneer's experience in applying tested techniques of steel making. U.S. licensor for the proven L-D process—also P.T. Oxygen Guns for present and planned open hearths.

These are reasons why Kaiser Engineers is uniquely qualified to develop your oxygen steel program. Another reason is traditional KE ingenuity—engineering and construction ingenuity which means your steel facilities will be completed more quickly, at lower cost, and operate more efficiently.

Economic analysis, plant location, engineering, design, procurement, expediting, construction—KE does one or all. With your first thought of new steel producing facilities—call KE.

KAISER ENGINEERS engineers—contractors
Contracting since 1914

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4381

N&W research has proved the locations of multi-million ton 97.8% pure limestone deposits

To a trained geologist, outcroppings such as these mean abundant limestone, but the scope and depth of the beds can be determined only through test drillings.

Norfolk and Western plant location specialists and consulting geologists have found in *The Land of Plenty* a vast source of top-grade limestone. One location alone is estimated to contain more than 100 million tons!

The beds range in thickness up to 100 feet, and the percentage of purity is almost 100%. Moreover, this limestone is easily accessible . . . which means increased operating economy for manufacturers needing high quality calcium or dolomitic limestone.

These statements are backed up by facts obtained through extensive research in the field and the laboratory. All findings have been confirmed and are open to your inspection.

Our plant location specialists will be glad to provide detailed information . . . in confidence and without obligation. Let them give you the facts on limestone and other advantages of *The Land of Plenty*.

The thoroughness of N&W research is depicted by this photo. Extensive drillings were made, and cores were sent to an independent geologic laboratory for scientific testing.

And here are typical analyses*

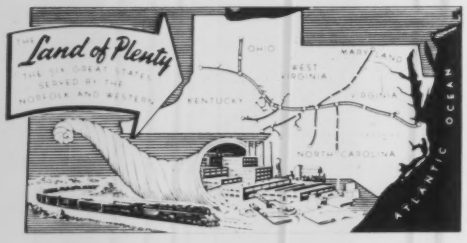
	DML-1-1	DML-1-2	DML-1-3
SILICA ($Si O_2$)	36%	30%	34%
IRON OXIDE ($Fe_2 O_3$)	.072	.043	.049
ALUMINA ($Al_2 O_3$)	.21	.20	.19
LIME (CaO)	55.00	54.90	55.40
MAGNESIA (MgO)	.65	.62	.51
SULPHUR (S)	.012	.011	.015
PHOSPHORUS (P)	.006	.006	.009
IGNITION LOSS	43.20	43.50	43.20
CALCIUM CARBONATE (Calculated)	97.90	97.72	98.51
MAGNESIUM CARBONATE (Calculated)	1.36	1.30	1.07

*Report prepared by Pittsburgh Testing Laboratories, Pittsburgh, Pa.

The minimum of dark spots in this typical test core indicates premium limestone — ideal for chemical lime, calcium carbide and other important processed materials.

Write, wire or call—

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer S-795 (Phone Diamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia



Norfolk and Western RAILWAY

Technical Outlook

NEW FORMING METHOD—The British report they're trying shot peening as a method of forming sheet metal. They control the force at which shot strikes and its speed. A fairly wide range of shapes have been produced in early tests.

RUBBER HAMMER— True 90-degree angles in metal plate parts are being made at Boeing Airplane Co., Seattle, by rubber facing the head of the drop hammer used in forming. Rubber matting is used for facing, and impact pressures have been held under 9000 psi. The rubber substitutes for lead dies. Estimated savings in a year: $12,000.

SLOWS COPPER CORROSION—Irradiation by sunlight or other intense light, which ordinarily accelerates corrosion of metals, retards copper oxide growth, says National Bureau of Standards.

ASSURES RUST RESISTANCE—To provide maximum protection against corrosion when using chromic acid rinses on phosphate coatings, an Army research report recommends this treatment: Remove phosphated steel from chromic acid rinse, dry with air, and immerse in a water-displacing preservative.

RESEARCH AT 6000° F— A laboratory device in which specimens can be exposed to intense heat will allow researchers to learn more about what happens to heat-resistant materials near 6000° F. Heat is created by focusing the rays of the sun in a huge curved mirror. Sensitive instruments measure the heat a sample radiates. Biggest advantage: The device overcomes the problem of "contaminating" container radiation.

KEEP COSTS DOWN— Three cost saving ideas turned up in Armco mills: 1. A portable heavy duty scale equipped with eyebolts for crane pickup. It moves anywhere in the plant where there's a scale breakdown. 2. Worn runout table rolls aren't scrapped. They're turned down and renewed with a shrink-fitted sleeve over the worn section. 3. When steel straps are removed from coils, strap fasteners are trimmed off; the straps are re-used on smaller coils.

IMPROVED CRUCIBLE LINING— A new lining that contains some 90 per cent alumina will extend the life of carbon bonded, silicon carbide crucibles, says Electro Refractories & Abrasives Corp., Buffalo. The lined crucibles are highly corrosion resistant. This is important in melting nonferrous metals when fluxes are used.

COIL STRADDLER— Coiled hot strip and skelp are being handled by Ross over-the-load carriers at the Aliquippa, Pa., plant of Jones & Laughlin Steel Corp. The carriers can transport three coils, or a total of 25 tons, on a mandrel suspended between the wheels. Longest haul to the storage area is 1¾ miles.

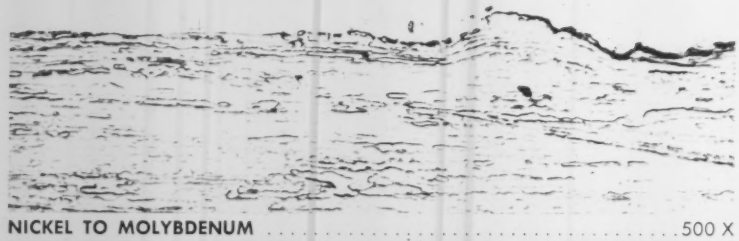
BURNER CONTROL— A 30 to 40 per cent increase in soaking pit capacity at Wheeling Steel Corp.'s Steubenville (Ohio) works has resulted from the use of refractory sleeves inside the soaking pit burner venturis. The flame now develops well back in the burner throat, freeing the center aisle of the pit (which was formerly reserved for flame development) for the charging of additional ingots.

EXTRUDED TITANIUM— Unalloyed titanium has been cold extruded at Battelle Memorial Institute, Columbus, Ohio. The researchers say it is a major step in the development of economic methods for the production of hollow aircraft parts. Another advantage: Thirty per cent increases in tensile strength are possible.

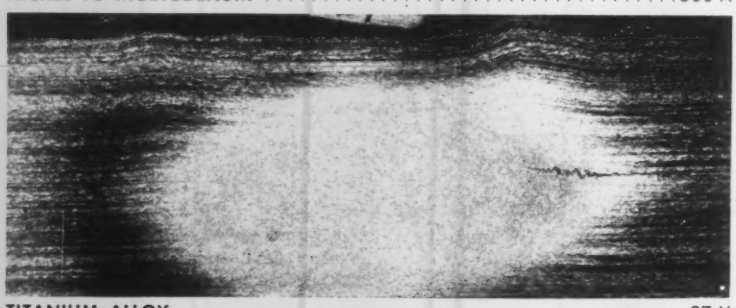
ROLL-YOUR-OWN WELDS— A small roller electrode made by Micro-Test, Los Angeles, is said to be a natural for delicate jobs. As the roller is pushed along a weld seam, it times spot-welder impulses. The electrode works with any condenser-type spotwelder equipment. Head size is about 1 by 1 by 2 in.

Some Typical Joints

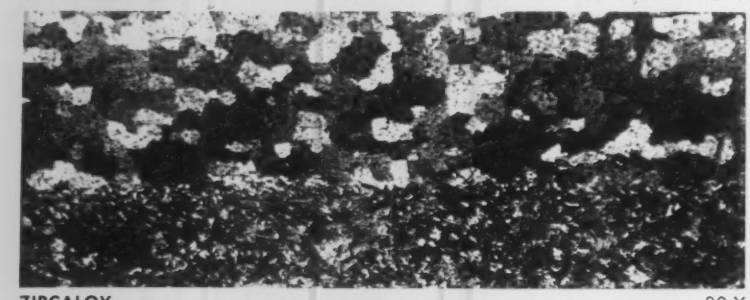
NICKEL TO LOW CARBON STEEL ..... 300 X



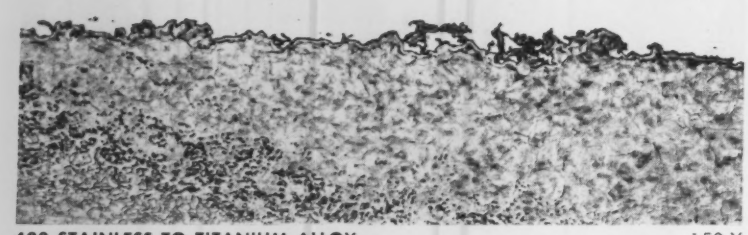
NICKEL TO MOLYBDENUM ..... 500 X



TITANIUM ALLOY ..... 27 X



ZIRCALOY ..... 30 X



430 STAINLESS TO TITANIUM ALLOY ..... 150 X

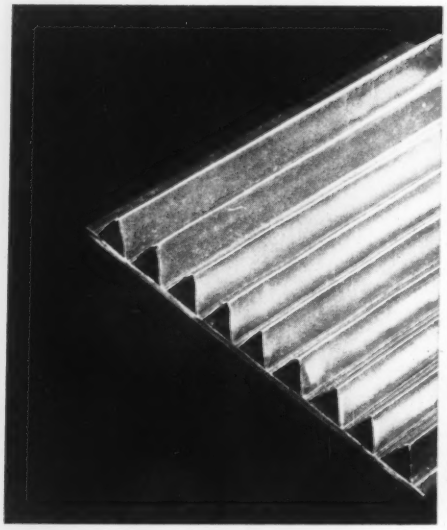
Ultrasonic

Method is handling greater thicknesses, producing stronger bonds, and tackling an increasingly wider variety of materials. Two things to look for: More seamwelding and the joining of odd shapes

IT'S time for metalworking management to take another look at ultrasonic welding.

These examples will give you an idea of the progress that has been made:

- Since 1954, the tensile strength of ultrasonically welded joints in aluminum sheets (1100-H14) has been increased ten times. (Equipment makers report equally great strides in joining structural alloys like Alclad.)
- The method is being used to join a wide variety of high strength, high temperature, corrosion resistant, and dissimilar metals. (Examples: Molybdenum, stainless, Inconel X.)
- New equipment is being used to



Outstanding example: Seamwelding

Welding Makes Rapid Advances

seamweld light foils at speeds up to 20 fpm.

• The method is being used to join oddly shaped parts.

Strength in Depth—Real progress has been made in welding harder and thicker metals. Today's military specification for spotwelded structural aluminum calls for a minimum shear strength of about 825 lb in 0.060 in. metal. Ultrasonically welded Alclad has a value of nearly 1400 lb.

The fracture strengths of 0.040 to 0.050 in. Alclad are more than twice those specified for military use. Solution heat treated 17-7PH (0.020 in. thick) has a tensile-shear strength one-third greater than military specs.

Variety — Ultrasonic welding is one way to get around heat problems. Aeroprojects Inc., West Chester, Pa., says satisfactory welds are being made with Inconel X, titanium alloys, zirconium, Zircalloy, molybdenum, columbium, and tantalum. In some instances, sintered aluminum powder has been welded. The method also produces good bimetallic welds without forming the brittle intermetallics common to such joints.

Odd Shapes—A spiral rib welded to a tube is a good example. Another: Fuel elements for atomic reactors (they come in a wide variety of shapes). All need special fixturing, says Aeroprojects.

Preparation—A promising feature of this method is its ability to make sound joints without elaborate surface preparation. Tests of 5052 aluminum alloy cleaned several ways (degreasing, caustic, bright dipping) failed to show any significant differences in weld strength. (Surface finishes before welding varied between 5 and 18 microinches.) Bare structural aluminum alloys (2014, 2024, 7075) need descaling, but they are exceptions to the no cleaning rule.

Ultrasonic welding works well with anodized aluminum and welds easily through thin coatings on insulated wire and foil. An exceptionally thin layer of plastic between two pieces of low carbon steel was no barrier to sound welds.

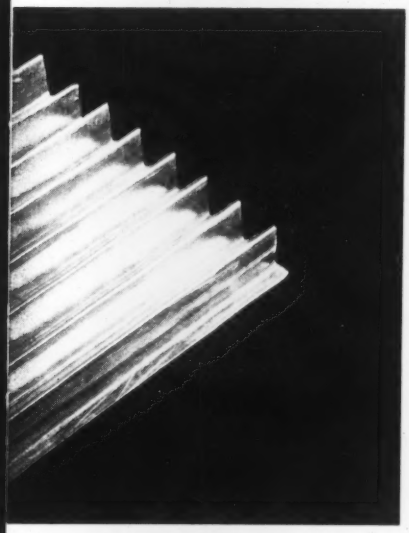
What's Ahead — Researchers at Battelle Memorial Institute, Columbus, Ohio, are making a survey of ultrasonic welding for the Air Force. So far, their investigations support the findings of others.

The principal aim, says R. E. Monroe, is to learn more about fundamentals.

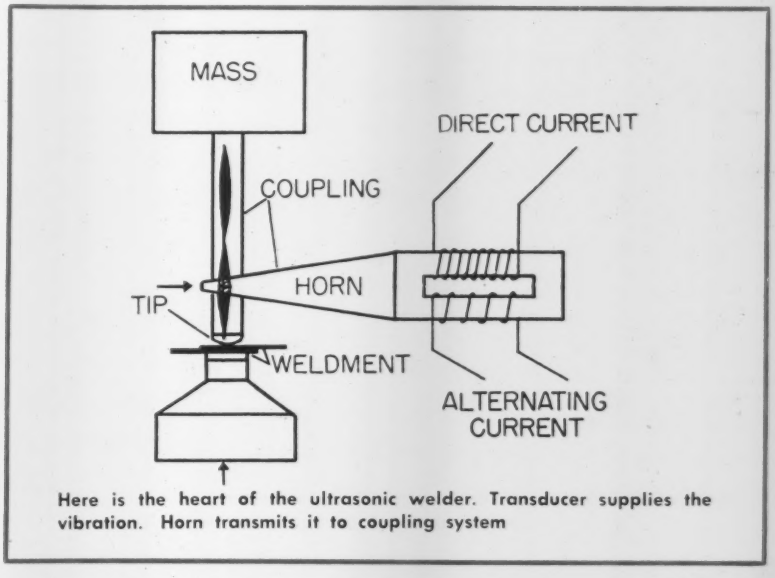
Others continue the search in several directions:

1. Better welds in heavier gages and harder materials.
2. More seamwelding machinery.
3. Improved methods of joining jewelrylike parts. (An example is attaching a 0.0015 in. tungsten wire to 0.025 in. copper wire.)
4. Increased use of ultrasonics in joining special shapes.

Weldermakers report some success with larger and heavier machines which are expected to pave the way to joints in thicker metal.



0.010 in. foil to heavy plate



Here is the heart of the ultrasonic welder. Transducer supplies the vibration. Horn transmits it to coupling system

Field tests like this one illustrated easy application in hard-to-reach places. As long as three or four threads are engaged, nut will pull bolt home

This Bolt Holds Better

Knurled shank cold works bolt hole and greatly improves resistance to shear in bolted joints. Lab tests and first applications indicate some reduction in labor costs

CONSTRUCTION people are using a new kind of bolt for structural joints that is hailed as a step ahead in fasteners. It's called the High Tensile Bearing bolt.

The producer, Lamson & Sessions Co., Cleveland, claims that the bolt has several advantages. Comparisons are made with other types of fasteners which are included in the company's line:

1. Joints resist shear twice as well as those joined by rivets, about 15 per cent better than standard high tensile bolts.
2. Positive bearing is about 10 per cent higher than that of joints held by high tensile bolts.
3. Fewer bolts may be needed.
4. One man can install them.
5. Joints held by the new bolt take no more time to complete than those held by standard fasteners.
6. It is not necessary to mask joints for painting.

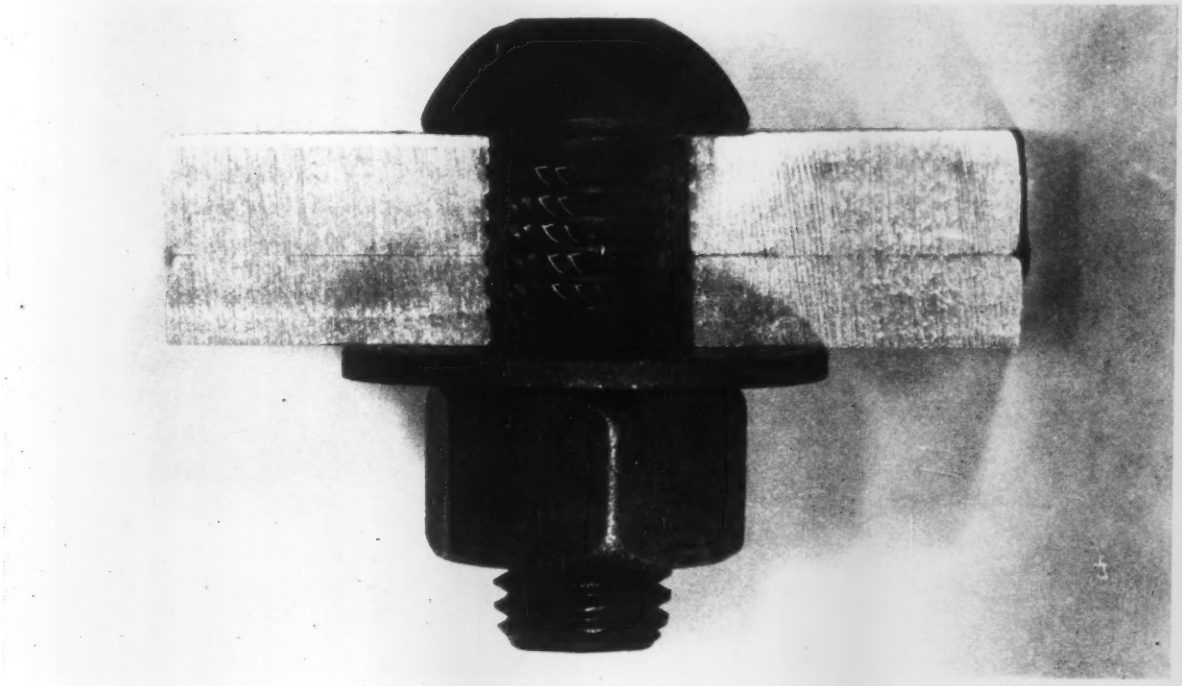
Description—The ASTM A-325 bolt has a spirally knurled body. Its head is similar to an upset rivet head with the head height of a high tensile bolt. Threads are National Standard (coarse), and it's assembled with one nut and washer.

The knurling gets most of the credit for improved performance. Each knurl has a ball face which cold flows grooves in the bolt hole. (The cold working offsets any notch effects.) As the bolt is forced into position, excess metal works behind the buttress shape on the back of the knurls. The effect is much like that of a hook, which makes the bolt stick tightly in the hole.

Knurls are rolled on the shank in spirals. They are relieved so that displaced metal doesn't pack and make the bolt hard to drive.

Lab Tests—The University of Illinois and Herron Testing Labs Inc., Cleveland, made static and fatigue tests of joints fastened with the bolt. The Cleveland firm compared several made of 1⅜-in. plates and two 9/16-in. butt straps. Results: Those fastened with rivets failed at about 45,500 lb; high tensile bolted joints failed at about 62,000 lb. The High Tensile Bearing bolt still held up at about 84,500 lb.

The university's report compares the old and new high tensile bolts.



These knurls put teeth into a holding job. It's not hard to hammer the bolt home, but hooking action keeps it in place once it's there

By W. G. WALTERMIRE
Chief Product Engineer
Lamson & Sessions Co.
Cleveland

It found that no more torque is needed to get 29,000 lb of tension with the new bolt. Joints bolted with the new bolt did not slip; those bolted with the regular high tensile bolt did. The testers also reported equal resistance to fatigue.

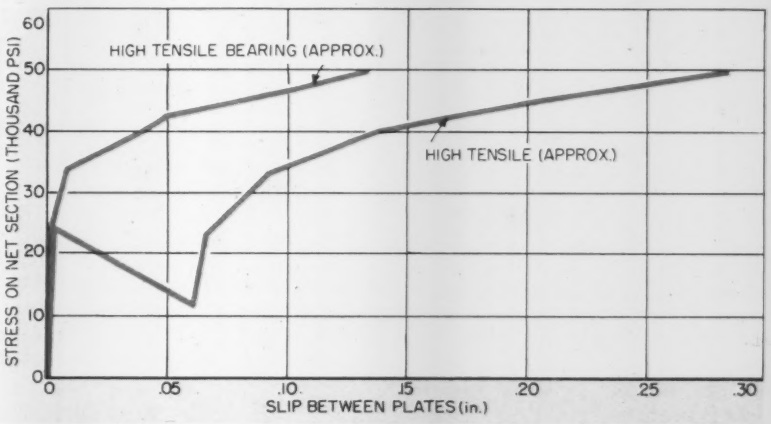
Trials — With holes which will accept regular high tensile bolts, the new bolts cost no more to install than regular high tensile types, says Vogt & Conant Co., Cleveland. The firm tried them out on erection of a midwestern auto plant addition. Costs decrease as structures become heavier.

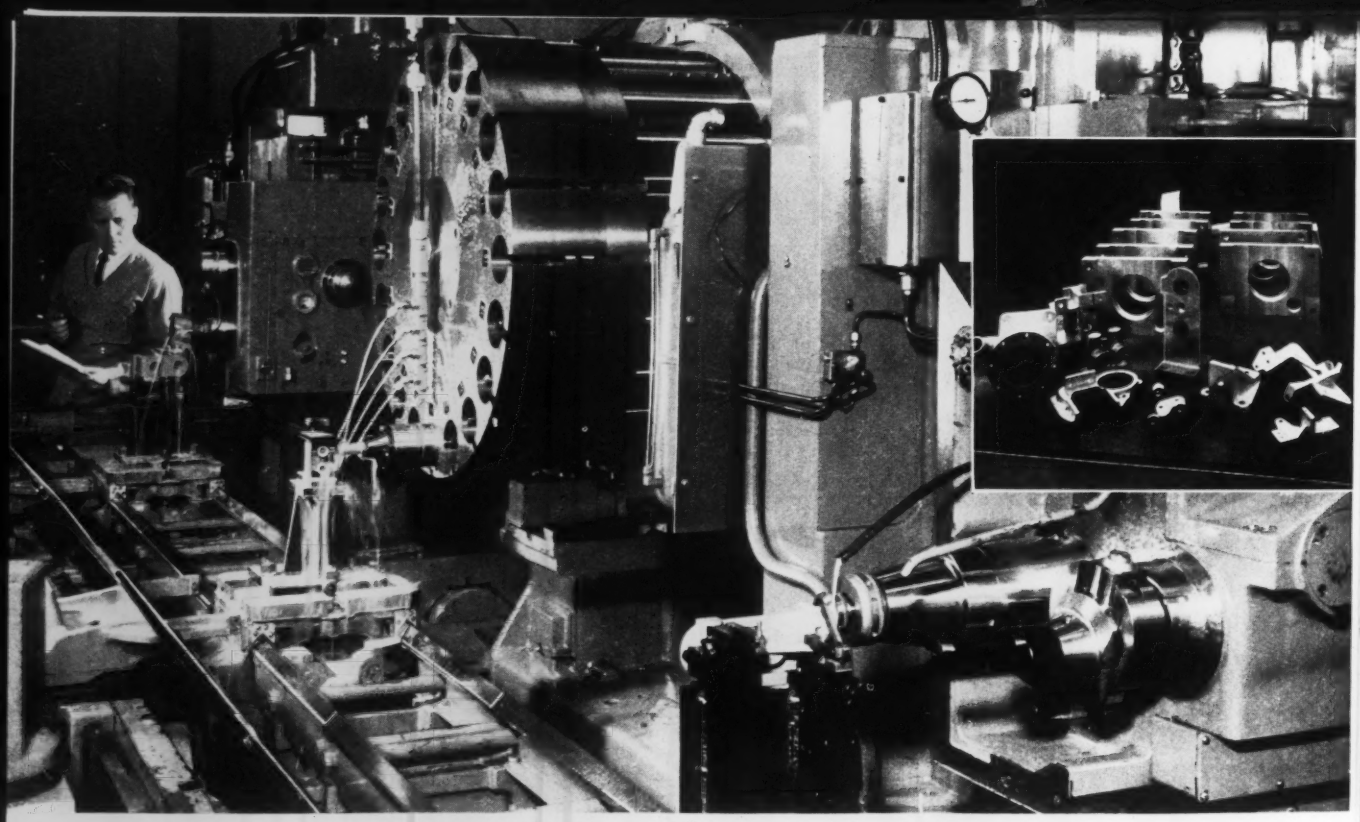
Kilroy Structural Steel Co., Cleveland, used them on a school addition. Its workmen noted that the nuts pulled the bolt home solidly as long as three or four threads were engaged at the start.

The Rock Island Bridge & Iron Works, Rock Island, Ill., used them to bolt a crane runway. Its conclusions back up those of the Cleveland firms.

Backing out hammers or universal adapters on the nut runners aid installation in tight places.

Here's a close-up of the burnishing action. Face of each knurl is ball-shaped. Graph (below) compares slip in test of joints held by standard and new bolts





Working as a team, milling, drilling, and boring machines (left to right) pass parts automatically as each operation is completed. Tapes control the cycle of each machine, index of the fixture when needed, and handle other functions like coolant flow. The inset shows a variety of parts that can be machined simultaneously on the line

Tapes Control Transfer Line

Tailored for continuous production of short lots, the line works on as many as four different jobs at once. Control elements and machines use building-block design

IT HAS become an axiom that when you have to make parts in short lots, you can't justify transfer-type special machines to produce them.

It is also pretty generally accepted that numerical control is ideal for short lots since it sharply reduces the time and cost of tooling and machine setup.

Why not combine the two? Get the efficient production rates of the transfer line with the versatility of numerical control?

Done—That's what engineers at Hughes Aircraft Co.'s product group asked themselves. They have come up with three machine tools, linked by a transfer line; all are controlled by a Hughes-developed Digitape electronic control.

The line will be moved from the product group plant to Hughes's El Segundo, Calif., plant where it will go into full production on a variety of parts. Up to now, it has served as a prototype for the control system which Hughes will market to other machine tool builders and users.

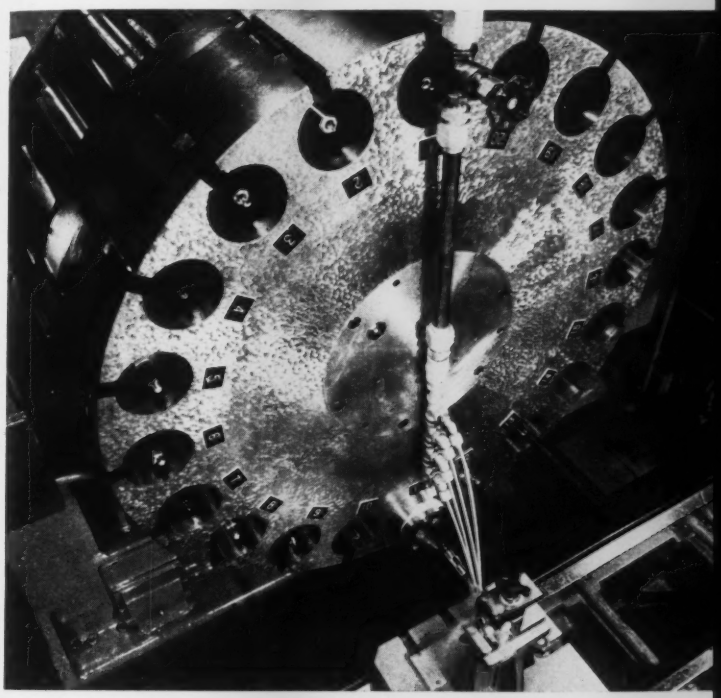
Building Blocks—The Digitape control unit is built from standard components. Only 19 different boards are needed to perform any of the machine or transfer functions called for. A user can start by installing partial control (say, just control the cycle of a single machine) and then can add control "blocks" as he needs to.

Rollin M. Russell, vice president and chief executive of the product group, says: "It is Hughes's intention to make its control systems available to all machine tool manufacturers and to manufacturers in other fields, such as industrial processing, where application can be equally effective. In fact, after years of research and development, this marks our serious entry into the field of industrial systems and controls."

The Machines—A milling machine, drilling machine, and a boring machine, all built by Kearney & Trecker Corp., Milwaukee, are

These controls guide the machine line through its performance. At the left are three control cabinets for the machines. Next to them are the four tape readers, one for each fixture on the line. Finally, at right, is the master control panel where the operator can start and stop the machines, readers, and transfer line

Engineer Ben Suleski checks an electronic compensator that allows for variations in cutter size. As the tools wear and are ground, or as new cutters are installed, the operator dials size corrections—doesn't need to correct the tape



The 20-tool magazine of the drilling machine is programmed by the tape so the right tool is positioned and fed at the right time. Each drill carries its own bushing, which is extended when the drill comes out. This precludes the need for separate drill boxes or plates for different parts

tied together through a transfer in the El Segundo line. The line uses four fixtures, one in work position at each of the three machines and one in the ready position. Four tape readers guide the fixtures through the complete three-machine cycle.

The operator loads a part in its fixture and sends it around behind the machines into the ready station. From there on the tape assigned to the fixture takes over. It cycles the milling machine through its three-axis travel, controls feeds and speeds, indexes the fixture when necessary. When the milling cycle is completed, the machine returns to a "home" position.

As soon as all three machines have completed their cycles, a transfer moves the four fixtures, shifting parts progressively along the line. The milled part is now in front of a 20-tool drilling machine. The tape selects the proper tool, indexes the drum to bring it in place, controls the speed and feed and coolant, and positions the spindle.

Again, if necessary, the tape will index the part at the proper time in the cycle.

Next, the part moves into position for boring. The boring machine has two spindles. Both can be used for end milling. One spindle has an offset boring bar—the tape controls the degree of eccentricity of the boring bar on the spindle, establishing the diameter of the bore.

Flexibility—Since each fixture is guided by its own tape, the machine can work on as many as four different jobs at once. Design changes (Hughes has had as many as 15,000 on a part in two months) usually can be made by correcting the tape, even during the production run.

Leadtime from the blueprint to production is cut drastically, and tooling costs are trimmed an average of 50 per cent, the company's experts say. On one job, eight separate fixtures have been replaced by a single work holder.

Since the setup consists of only two steps (putting the tape on the reader and the fixture on the pallet), the machine can reduce inventory requirements. Parts can be made quickly and economically when they are needed and in the most economical quantities.

Cost—Hughes's setup, with the controls and three machines, would cost about $450,000, says one spokesman. He estimates that this about equals the cost of standard machine tools necessary to get the same capacity for one part. As the number of jobs on the numerically controlled line goes up, the capital advantage mounts.

Other users may select fewer or more machines, or may need a different arrangement of them. Since each is designed to be integrated with others, future requirements can be met by adding, subtracting, or rearranging the machines. Machines and controls will be marketed through K&T sales channels. Production models are expected to be ready for delivery this year.

Designed for high temperature duty, these Inconel baskets permit a longer period for heat treating and quenching

Heat Treaters Take Note

USE of Inconel heat treating baskets resulted in production increases, quality control improvement, and cost savings at Bassick Co., Bridgeport, Conn.

They were recommended by Wiretex Mfg. Co., Bridgeport, because of their ability to withstand high temperatures and corrosion during extended heat treating and quenching. The baskets provide ample space for a well distributed workload of hot or cold rolled steel 1/32 to 1/4 in. thick. They are reinforced with heavy supports and, in some cases, separators. All are designed for ample free flow of oil during quenching.

Benefits—Work is now free of scale, and secondary operations such as sand rolling have been eliminated. Used 12 hours per day over a five-day week, their life span has been eight to ten months—three times that of former containers.

The Lindberg furnace used has a capacity of 500 lb which includes weight of baskets plus the workload. Work is brought to a heat of 1600° F.

A large diameter steel head takes form on one of Claymont's spinning machines—units that turn out heads up to 19 feet in diameter, in ferrous and non-ferrous metals. Integrated facilities make Claymont a reliable source of quality steel plate and plate products for industry.

by d'Arazien

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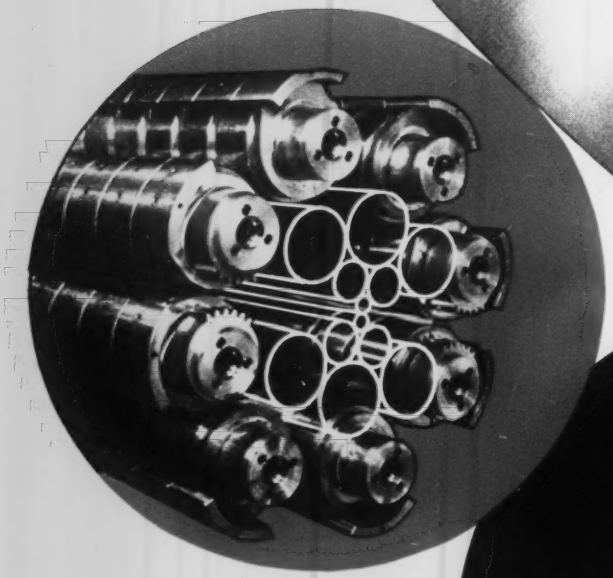
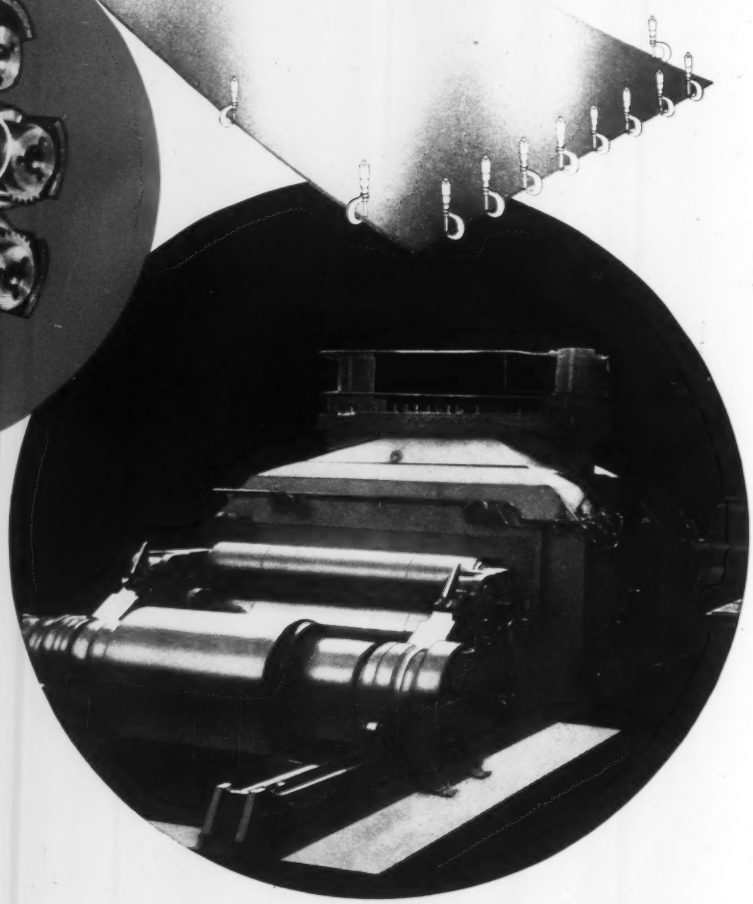


Phantom view of roll arrangement



This Sendzimir cold strip mill rolls 80" wide low carbon steel from hot rolled thickness to .024" with total gauge variation of .0004". Similar uniformity is being regularly obtained on Sendzimir cold strip mills rolling brass, copper, aluminum, stainless steel, silicon steel, etc.

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QUALITY: Customers are demanding better and more uniform refractories. Specifications will get tighter.

MATERIALS: Natural materials will continue to lead synthetics because of their economy. But beneficiation of natural materials will receive increasing attention. Synthetics will eventually replace some of them.

CASTABLES: They will replace some prepared shapes. Their cost advantage and usefulness will grow.

SUPPORT: Sprung roofs will be with us for a long time due to their economy. Benefits of suspended construction in roofs and walls will continue to be investigated.

ACID vs. BASIC: Both materials will continue to find good uses. The trend is toward basics, but it will slacken or even reverse during periods of low production.

SUPERREFRACTORIES: Cost is the key here. They will continue to be used in small trouble spots, more rarely in large areas.

NEW PROCESSES: Developments like the oxygen converter will create markets for new refractory types, such as tar-bonded dolomite brick and ramming materials.

What's New in Refractories

"YOU CAN take a carload of brick made today and expect the same performance of every one in the lot," says a refractory engineer. "You couldn't do that ten years ago."

He has his finger on the overriding trend. Lots of other things are happening to refractories (see checklist), but quality control is the big news.

What It Means—It has resulted in a wave of modernization in the refractory plants—new continuous kilns, new milling and blending equipment, new presses, and much process instrumentation and testing equipment. Not so long ago the only significant test of a refractory was to build it into a furnace and wait for it to fail. Now laboratory tests predict performance accurately and aid in product betterment.

Some steel companies are rating manufacturers by how well their products show up in the lab. They will pay premium prices for those that meet tight specifications. The rising cost of refractories (from $1 per ton of steel after the war to $3 per ton today) partly reflects what it takes to make them precision products.

Basic Forges Ahead—Quality control may be the last big avenue of improvement open to fire clay and silica refractories. Basic refractories aren't so restricted. A steel plant ceramic engineer who has had long experience with them thinks we've only scratched the surface.

Their high cost has held them back, but the price differential between basic and acid brick is beginning to close. A typical open hearth roof wedge made of basic brick costs 4½ times as much as its silica counterpart, but the ratio was closer to 5 to 1 not long ago.

Recession—First cost difference of refractories can be formidable, but there are strong arguments for ignoring first cost in favor of the cost per ton of metal produced. Such arguments are easier to swing when times are good, so the steady rise of high cost basic refractories may taper off a little until the economy gets stronger. A few furnaces with basic roofs or port ends may go back to silica while the pressure is off, but there's no doubt about the long term trend toward the all-basic open hearth.

Furnace roofs of basic brick cast from materials fused in an electric furnace are being installed in several furnaces. Although they are ten times as expensive as silica roofs, they can be justified by performance. The first such roof lasted 555 heats.

That campaign was spectacular enough to convince several steel companies to give it a try.

Carbon—Another way to keep a furnace on the line is to keep the bottom in shape. What's wanted: One that soaks up heat fast and gets rid of it fast.

One steel company thinks a carbon subhearth is the answer. It is now installing its second. The first showed a 60 per cent reduction in bottom delays, higher bottom temperatures, faster temperature recovery after repairs, and labor savings in installation.

Oxygen Converter—Such savings and the ability to withstand higher temperatures add up to more tons of production per hour. Trouble is, open hearths on the average are hard pushed to produce 40 tons an hour, while the basic oxygen converter can easily maintain a 60-ton rate if it can get the hot metal.

We are going to see a lot more oxygen converters, and they will provide refractory makers with a market for new type products. The most promising at the moment is tar-bonded dolomite brick, which has been successful in European converters. The bricks are burned in the vessel to carbonize the tar before the vessel is used.

Ironmaking — Carbon is doing well in the blast furnace. A growing number of furnace operators

"Gunning" a soaking pit roof with a castable refractory, one of the newer techniques speeded by economic changes

are convinced that it's the standard lining for hearth walls and probably the bosh. The carbon dissipates heat more effectively than fire clay, so that bosh cooling can be simplified.

Dollarwise, a carbon bosh and a clay brick bosh with copper cooling plates aren't far apart. Additional capacity gained by the thinner carbon walls is a strong argument.

Some mills that first tried carbon in big blocks are turning back to standard brick shapes and sizes. Masons don't like to handle the big blocks. Sometimes it takes riggers to move them, and that can lead to union jurisdictional squabbles.

Castables—The growing scarcity of competent masons has been a big factor in the rise of castables and ramming materials. A lot of these materials, put in when bricklayers weren't available, have done so well that there's not much point in going back to brick.

Castables and ramming materials are being used for soaking pit covers, open hearth doors, hot blast main liners, iron ladles, reheating furnace walls, electric furnace roofs, soaking pit copings, and furnace bottoms. One of their big limitations was shrinkage. It's being licked.

Tenor of the Times—Some of the other things going on in refractories can't properly be called trends. Example: There was a wave of offsite furnace construction last year, but such activity shrinks in importance when construction and production are both down.

Day-to-day maintenance also fluctuates with the operating rate. Mills are cutting back on inventories or refractories—they're down to a month in some cases. Mills know they can get quick delivery.

Basic research in ceramics is being steadily stepped up in steel plants and refractory plants. The refractories that make higher production possible today are tomorrow's bottleneck. Research will provide the answers.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Cheaper Bearings

TIN combined with aluminum makes a superlative bearing metal, says the Tin Research Institute, Columbus, Ohio. Its experience with the composition in machinery, trucks, and foreign cars (Fiat) shows these advantages:

1. You don't need hardened shafts.
2. Shaft wear is normal without indium-lead or tin-lead overlays on the bearing.
3. The composition doesn't corrode in engine crankcases.
4. It eliminates the problem of copper penetrating crankshafts.
5. Such bearings can be bored (aligned) in position.
6. The alloy has improved fatigue resistance.
7. Bearings are less expensive than comparable copper-lead types.

Improvement—The alloy is overlaid on thin strips of steel which lend rigidity and support to a comparatively soft metal.

The latest composition contains about 20 per cent tin which differs from earlier types containing up to 6 per cent. The tin distribution pattern is called reticular (a network within a continuous matrix of aluminum). Its advantage: When running conditions cause overheating, the tin melts and flows to the bearing surface. Friction is gone. The matrix remains strong enough to resist thinning and spreading.

Trims Finish Cost

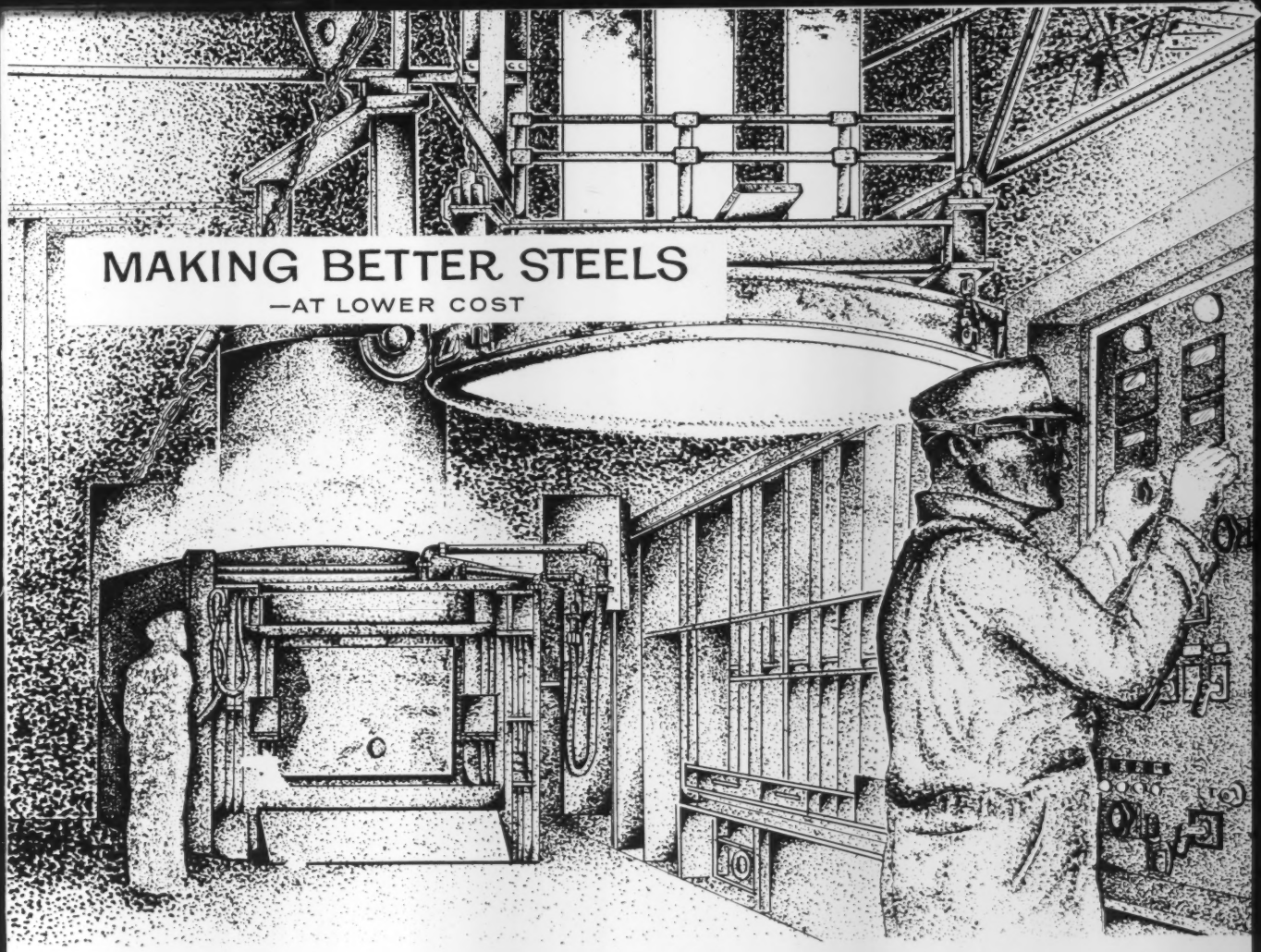
A variety of small parts formerly hand finished are now tumbled by AiResearch Div., Garrett Corp., Phoenix, Ariz.

Parts cost less and rejects have been reduced almost 80 per cent.

Example — It used to take 96 hours to hand finish 12,000 pieces of one item. The same job now takes only 2½ hours in a machine made by Roto-Finish Co., Kalamazoo, Mich.

AiResearch makes close tolerances parts for aircraft. Samples of parts were first submitted to Roto-Finish for analysis. Its report recommended a 10 cu ft, four compartment unit. AiResearch has added eight others.

Data show that the machine does not work well on a flat, smooth surface — it works best on sharp edges and radiuses.



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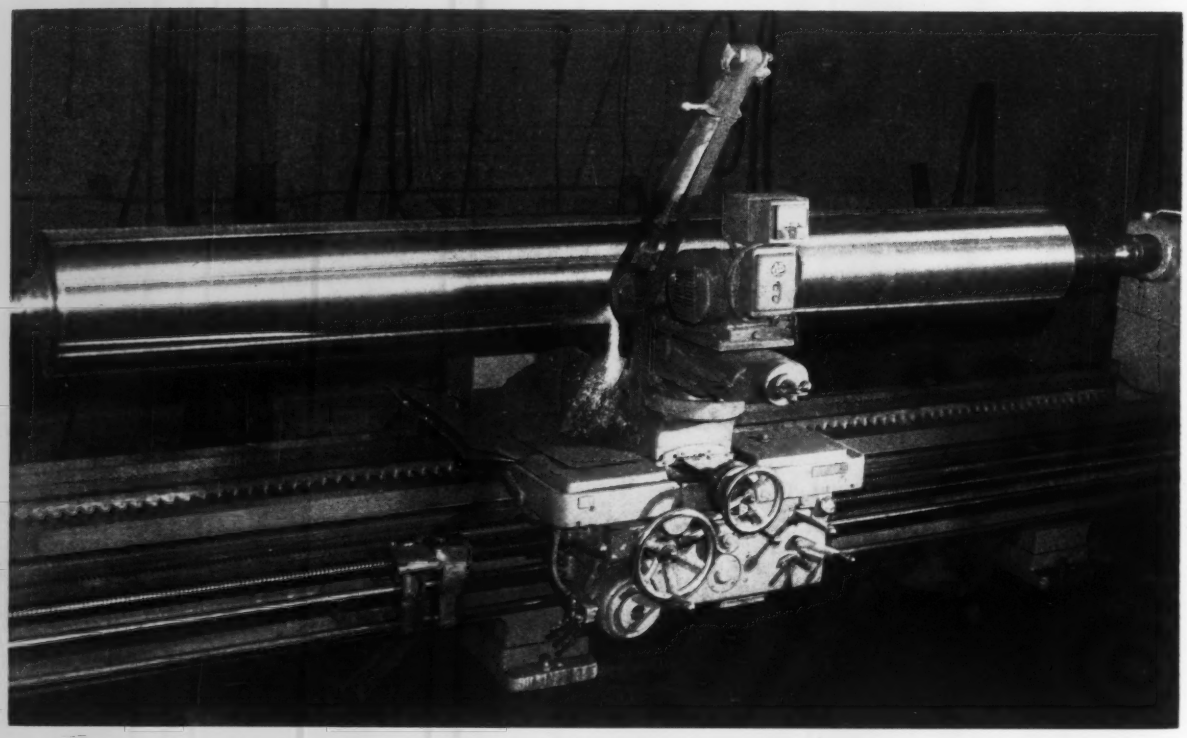


Belt attachment, installed on an engine lathe, grinds a mild steel rotogravure cylinder (17 in. in diameter by 12 ft long) to a tolerance of plus or minus 0.002 in.

Abrasive Belts Cut Roll Grinding Costs

It is a practical and economical way to do rough and finish grinding. You can convert standard roll grinding machines to take belts or install attachments on lathes

A MANUFACTURER who sent his rolls out for grinding saved $150 to $200 a roll (not counting the elimination of transportation time) by becoming a do-it-yourselfer.

Another example: It took 30 hours to turn down commutators for large electric motors with a single-point tool setup. Time was cut to 12 hours when abrasive belts were used.

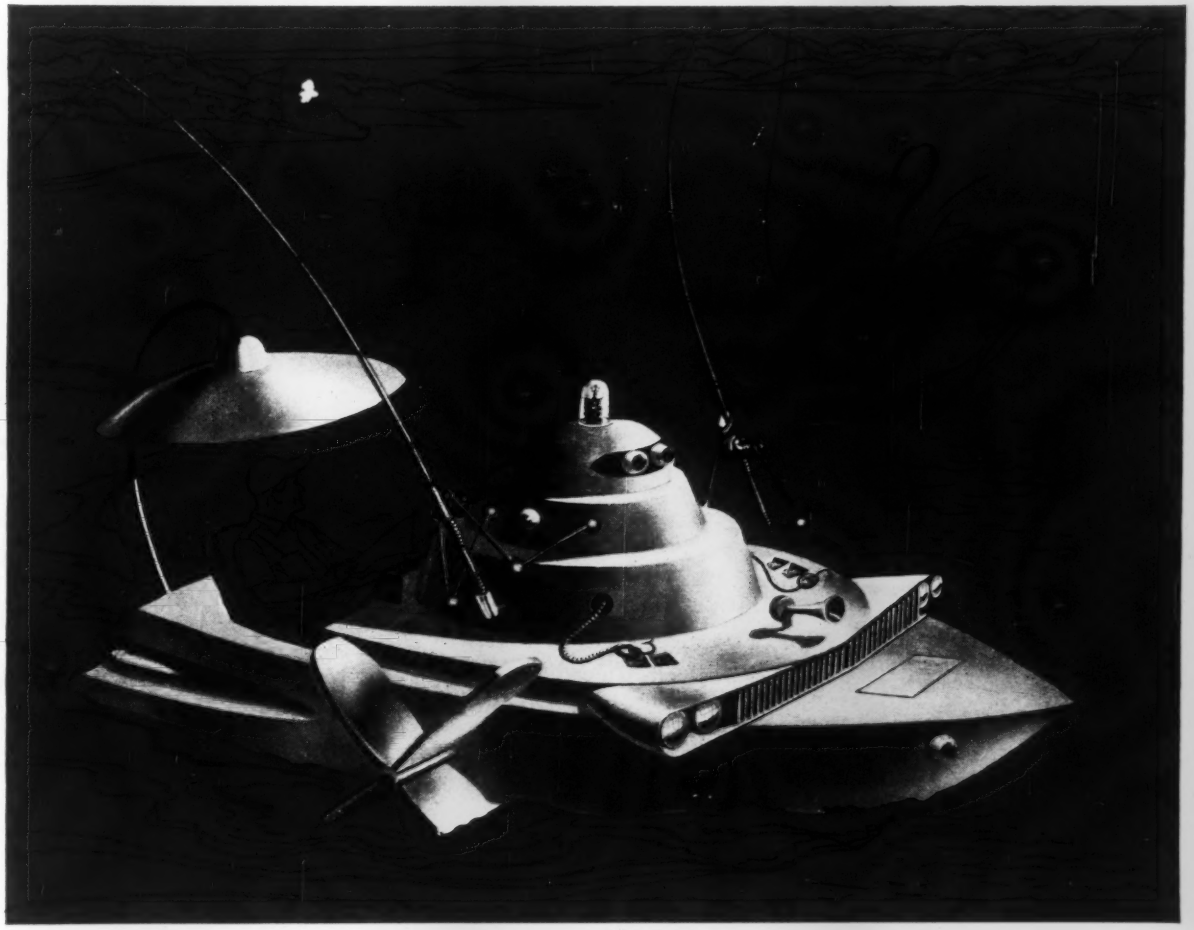
Significance — Belt grinding has become an established production method. When using belts, abrasive costs are the same or somewhat higher than those of wheels. Offsetting advantages stem from the high rate of cut and the rapidity of belt changes to finer grits. They reduce finishing time and total costs.

Here is helpful information on installing and using abrasive belts from Warren K. Seward, supervising engineer in the Coated Abrasive Div. of Carborundum Co., Niagara Falls, N. Y.

Equipment—Roll grinding with belts requires the use of machines and attachments that are rigid and in good condition. Machines that use wheels can be converted by mounting a backstand idler and an extension frame. The grinding wheel is replaced by a contact wheel.

For dry grinding, a good dust collecting system and chip removal facilities are essential. When a coolant or lubricant is used, the idler and the belt should be completely enclosed.

Attachments — Grinding can be done with a belt attachment on any engine lathe which is large enough to accommodate the rolls. If the attachment is to be removed and



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replaced frequently, it is usually attached to the lathe compound. If it is to be permanent, it is better to remove the compound and fasten the roll grinding attachment to the upper movable portion of the cross slide. It provides a greater bearing surface (and greater rigidity) while maintaining the infeed mechanism of the cross slide.

Power Needed—A belt grinding attachment will pull from 3 to 10 hp, depending on the size of the belt. Motor load indicators should be used to determine most efficient belt use with a given size motor.

Belt Selection — Belts for roll grinding usually are 2 x 100 in., or 4 x 132 in. Aluminum oxide or silicon carbide in a waterproof, resin, or glue bond can be used, depending on the material being ground.

For heavy roughing cuts, a cloth belt in resin or waterproof cloth is best. Paper-backed belts may be used for light grinding or final finishing, except where the work is done on the slack of the belt.

Grit sizes to be used depend on the amount of stock to be removed and finish required. They range from 36 for roughing cuts to 180 or finer for finishing.

Coolants—Lubricants should be used in grinding metal rolls. They can be straight oil types or water soluble oils, preferably with anti-weld agents and extreme pressure additives. The same type of lubricant used in machining operations can be used for belt grinding. On cast iron, a water-soluble coolant is best to prevent overheating of the material being ground.

Coolants maintain a more uniform temperature of the roll, increase belt life, give a better finish, and usually reduce the power consumption for a given stock removal rate.

Speeds and Feeds—Belt speed for most metal roll grinding will fall in the range of 3500 to 5500 sfpm, depending on the material being ground. Copper, aluminum, brass, soft cast iron, and other free machining materials can be run at 5500 sfpm, and often as high as 6000, with good results.

Roll speeds for roughing and semi-finishing usually fall between 50 and 125 sfpm. Finishing speeds are often considerably higher.

The contact wheel should always rotate in the same direction as the roll, which means that at the point of contact the belt direction is opposite to that of the work.

Traverse speed of the belt can range from ½ in. per roll revolution up to three-fourths of the belt width per roll revolution. The greater the amount of stock to be removed, the lower the traverse speed should be.

Removal Rates—The depth of cut that can be made varies with materials. It has been possible to remove 0.002 in. per pass on a soft cast iron roll turning at 156 fpm at a traverse rate of 7½ in. a minute. This cut removes about 40 lb of metal an hour.

On harder cast iron rolls turning at 110 fpm, only 0.0003 in. per pass could be removed at a traverse rate of 10 to 11 in. a minute. Stock removal in this case is only 16 lb an hour. On softer metals, it is possible to take deeper cuts.

Troubleshooting—Chatter in the finished roll surface (assuming the machine and grinding attachment are rigid) is usually the result of excessive roll speed. A belt splice that is too heavy or stiff, or an out-of-round or out-of-balance contact wheel may cause chatter.

A barber pole effect on the work can usually be eliminated by truing the contact wheel or relieving the edges of the wheel. With proper wheels, belts will give good service.

Accuracy—This is highly dependent on the machine. In the case of a grinding wheel machine converted to use belts, the belt will duplicate whatever accuracy the wheel produced.

An engine lathe that will produce a tolerance of 0.001 in. when used for metal turning, will produce the same tolerances when equipped with roll grinder attachments.

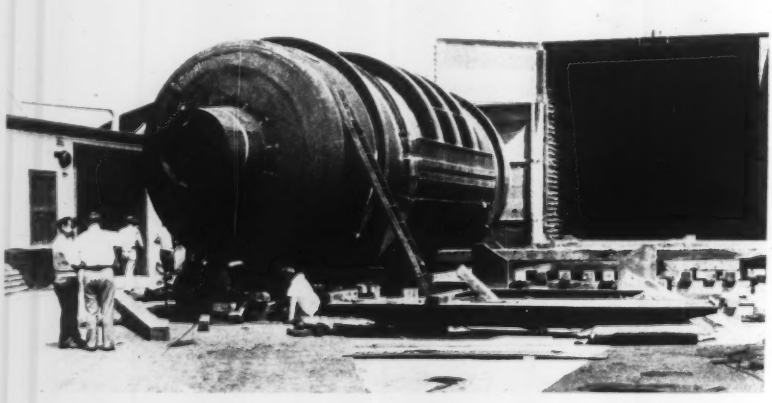
To maintain the accuracy of the lathe, it is recommended that telescoping covers be attached to the carriage and ends of the lathe bed to protect the ways from the abrasive effects of the grinding swarf.

T-1 Steel Used for Test

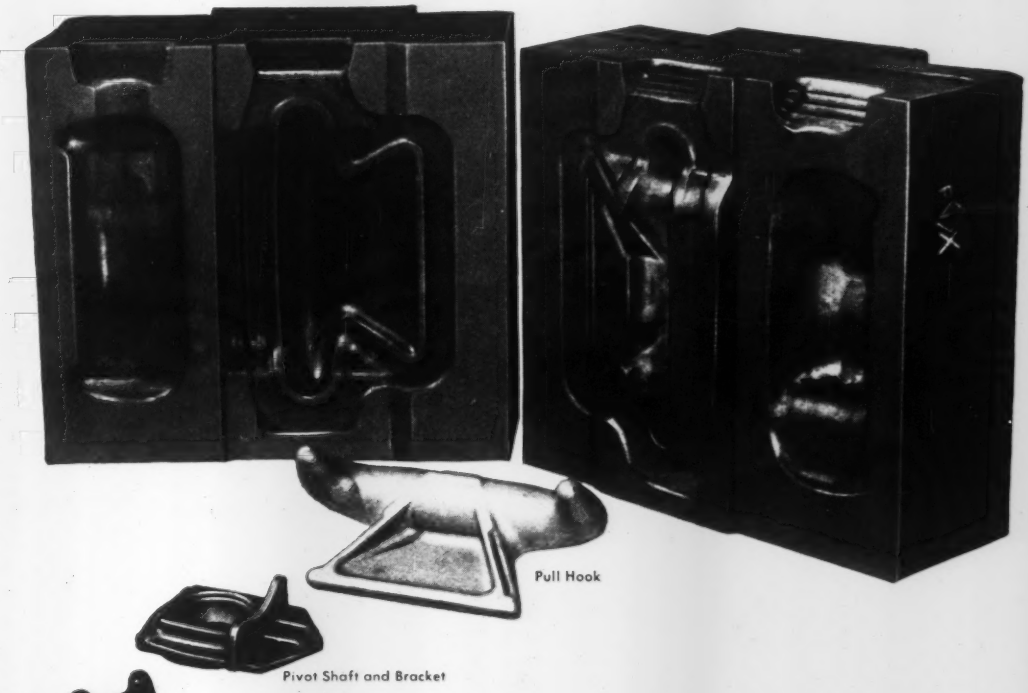
A CHAMBER which will be used in the development of nuclear aircraft engines is being fabricated of T-1 steel produced by Lukens Steel Co., Coatesville, Pa. Savings in manufacturing and transportation costs are reported.

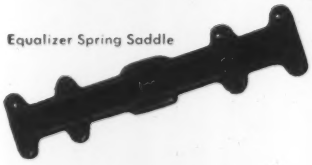
T-1 was specified because the unit had to combine strength (pressures will be as high as 250 psi) and lightness. The chamber will weigh 160 tons vs. more than 250 tons for one made of carbon steel.

The $500,000 project was fabricated at the shops of O. G. Kelley & Co., Boston, and was heat treated in a 50 x 20 x 20 ft gas-fired annealing furnace built by the same firm. Final installation will be at the CANEL Project (Connecticut Aircraft Nuclear Engine Laboratory), Middletown, Conn.



Nuclear engine test chamber being moved to special annealing furnace





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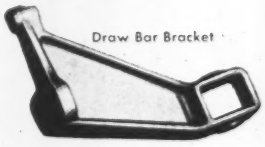

International Harvester Company's Tractor Works, for one, uses Finkl die blocks to produce numerous tractor parts such as the pivot shaft bracket, pull hook, track link, equalizer spring saddle, and draw bar bracket shown on this page.

Because of the high volume production of these Crawler Tractor parts, Finkl FX die blocks are used at Harvester's Tractor Works to produce more forgings per sinking, and more sinkings per die. The special machining quality reduces die sinking time, without impairing the heat or wear resistance of the dies in production.

Finkl die blocks are available in several grades, all sizes, and tempers to handle virtually any forging requirement. Call your local Finkl representative next time you are considering die blocks or forgings. He will be glad to help you and there is no obligation.

DIE BLOCKS · FORGINGS · HOT WORK STEELS · ELECTRIC FURNACE STEELS

A. Finkl & Sons Co.

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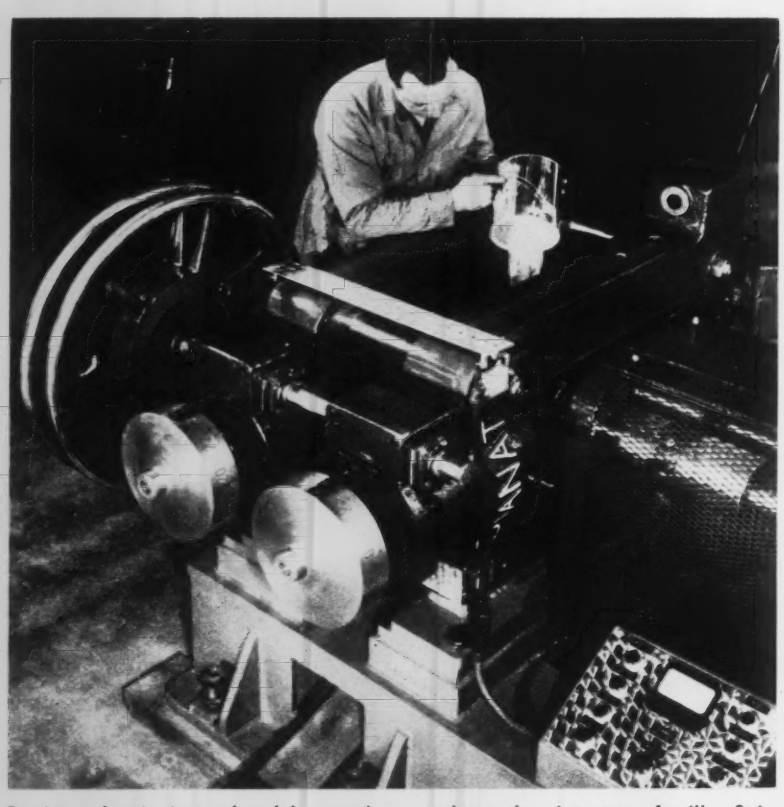


Presintered strip is produced by pouring metal powders into top of mill. Strip is emerging from chute under machine

Mill Does Many Jobs

A HORIZONTAL rolling mill which compacts metal powders directly into sheets and strip can be converted to a vertical combination mill for operations that follow sintering. It was designed to produce ferrous and nonferrous materials 7 in. wide and 1/32 to 1/8 in. thick.

Possibilities—In tests by its maker, Stanat Mfg. Co., Westbury, N. Y., the mill has compacted such diverse powders as aluminum, stainless steel, molybdenum, and tungsten.

It is expected to aid pilot production, research, and development of many critical items. Examples: Nuclear fuel elements, aircraft filtration systems, and new alloys for rockets and ballistic missiles.

Wider and larger diameter rolls can be used to increase capacity. The mill will do either hot or cold rolling. Rolls equipped with electric heater elements can be supplied.

Variety—Strip is produced with minimum trial and error. Material may be presented to the rolls by several uniform hoppering techniques aided by vibrators. Laminations are produced by directing dissimilar powders into the roll gap, and powder may be compacted between strips of metal to form a "sandwich."

Process—Metal powders compacted into strip are usually sintered within a protective atmosphere; then the strip is rerolled in a 2 or 4 high rolling mill.

The same powder compacting rolls may be used for such 2-high work as breakdown and sizing of skin passing. They also serve for 4-high work where strip can be reduced to 0.0005 in.

Moving Small Parts

Adoption of up-to-date methods has reduced this company's material handling costs

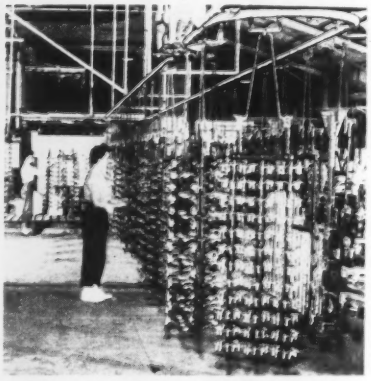
AN OVERHEAD conveyor system has made the handling of intricate and odd-shaped plumbing fittings easier and faster at Harcraft Brass Div., Harvey Machine Co., Torrance, Calif. Its new system carries parts through polishing and washing, plating, and final inspection. Costs are said to be greatly reduced.

Installation—Working with engineers from the Chainveyor Corp., Los Angeles, Harcraft planned a system which moves parts through the plant in three sections.

The first loop carries wire baskets of parts to machine operators. After polishing, the parts are returned to the baskets and conveyor.

The conveyor next moves parts through a washing machine which removes all grit, dirt, and polishing particles. Parts are then ready for plating.

In the plating room, parts are removed from the conveyor, inspected, regrouped according to item, and racked for plating. (A merry-go-round table speeds the process.) Racks are placed on the next conveyor and carried to a completely automatic plater.



CONVEYOR RACKS
. . . organize odd-shaped parts

After plating, parts move on the third conveyor to final inspection where they are removed from the racks for shipping. Empty racks stay on the conveyor and travel through a chrome stripper and water rinse which removes all residue.

Better Tools...

BEGIN WITH

SHARON QUALITY

ALLOY STEELS

What's new in the way of garden tools? This tool caddy, for one thing, and Sharon metallurgists know all about it.

Sharon has been supplying carbon, stainless and special alloy steels to garden and farm implement manufacturers for more than 50 years and they know the industry and its requirements.

So, if you're in the business of farm and garden tools, isn't it just good business to become acquainted with . . .Sharon Quality Steels?

SHARONSTEEL

SHARON STEEL CORP.

SHARON, PENNSYLVANIA

Breakout man loads pallets with parts for one subassembly. Pallets are aligned with one of four powered roller conveyors which goes to assembly area (opposite page)

Automatic System Trims Handling

Maker of outboard motors puts assembly, material handling, and shipping in a continuous line. From receiving to shipping, production parts are distributed mechanically

IF you assemble a wide variety of small parts, here's a way you can cut handling costs.

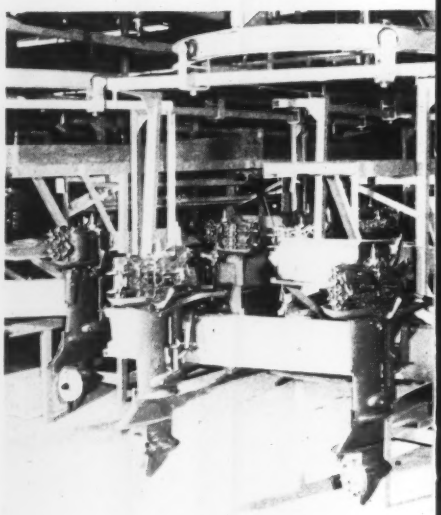
Evinrude Motors, Milwaukee, did it by building a plant which incorporates the latest ideas in stock storage and handling. Its outstanding feature: There is no manual lifting.

Plan—Chiefly a facility for the assembly of outboard motors, its layout puts assembly, material handling, and shipping in a continuous line. All material is moved or stored in mobile racks or conveyors. None is stored on the floor.

The plant has 7 miles of conveyors, including power chain conveyors, live rollers, electrified monorails, powered floor rails, and gravity pitched conveyors in six-high tiers.

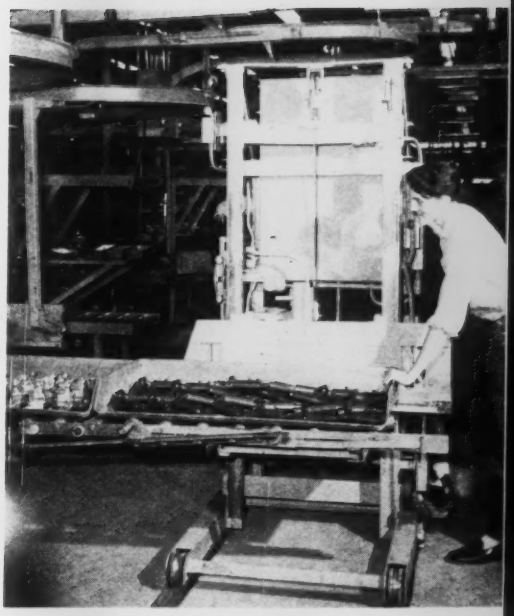
A 1000-ft monorail carries motors on "C" racks through assembly, testing, and finishing. Transfer lifts take motors to three monorail heights. They also lift racks between the main floor and ceiling storage. A console control selects packaged motors and routes them to shipping.

Start — Material from receiving docks is moved by lift truck to floor conveyors for receiving, inspection, and testing. Skid boxes (24 by 28 by 36 in.) are stored on



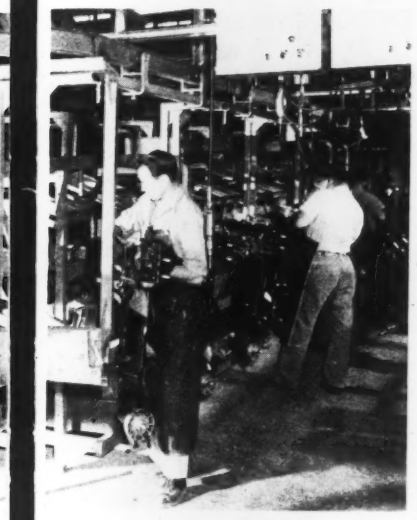
These subassemblies have just been painted. Conveyors carry them through

Cylinders and parts for the powerhead arrive from breakout section (left) for these assemblers. Completed subassemblies pass on to final assembly or storage

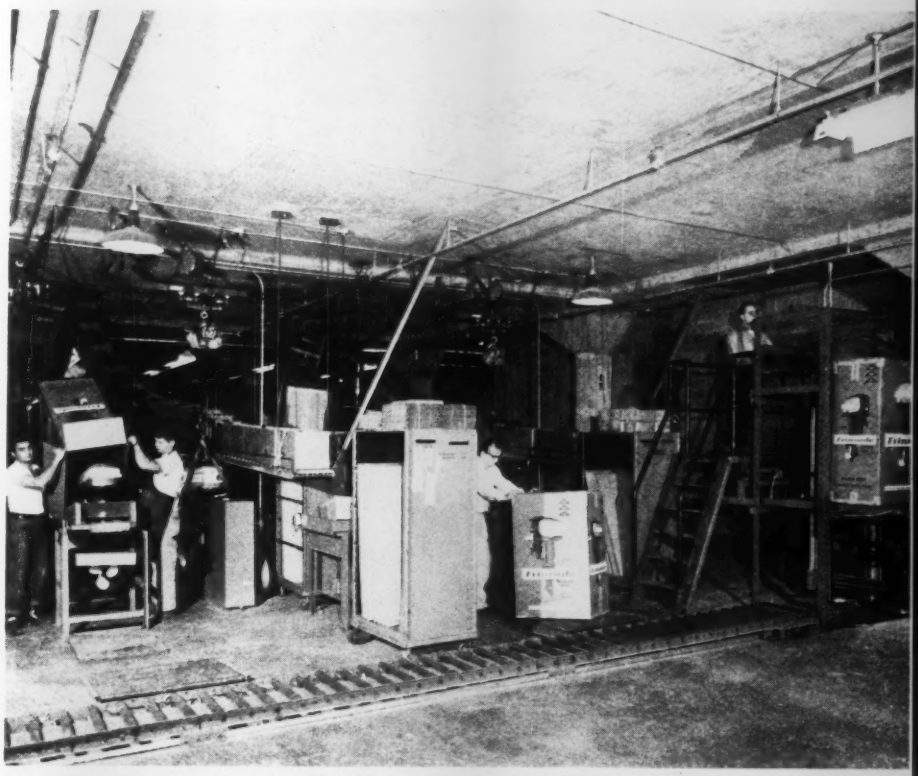


This electric rail car transfers pallets of subassemblies from five-level storage conveyors to seven final assembly lines

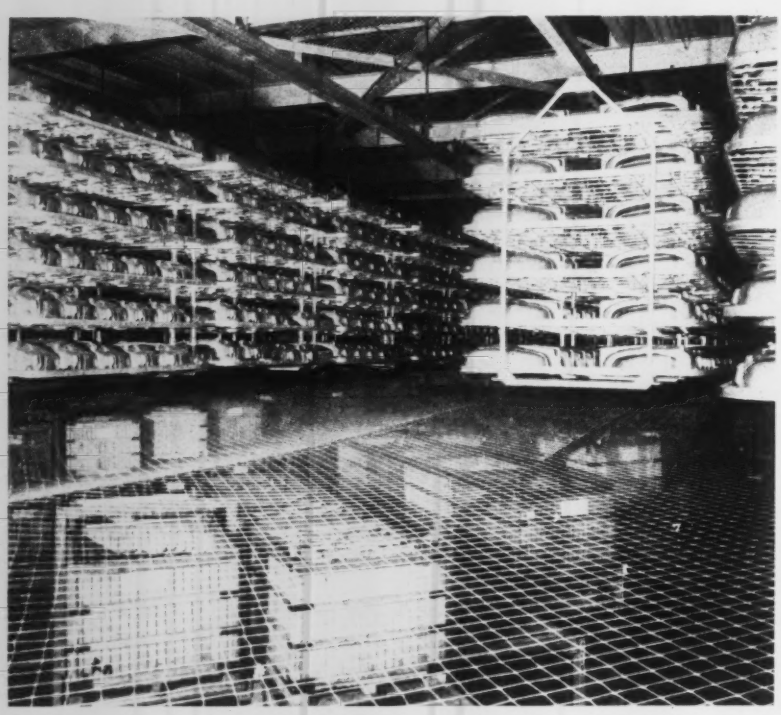
Costs



final assembly for carburetors, starters, and wiring harnesses



Motor packing is mechanized. Boxes arrive in chutes and are placed over motors mounted on turnover fixtures. Operator controls elevator and movement to 30 storage stations. Gas tanks are packed the same way



Forty-five of these monorail storage carriers hold 40,000 motor covers in space normally considered too high for such use. Guard netting prevents workmen from being hit if covers fall

roller conveyors six tiers high. They are pitched to permit a first-in and first-out flow. Parts are identified by colored cards and metal tags.

Diecast motor covers are put on shelved racks and moved on trolleys to a lift which stores them on ceiling monorails (45 hold 40,000 covers).

Parts stored in skid boxes are moved by lift trucks to three breakout areas. A worker places parts on shelved curtain racks hung from monorails which go to 15 subassembly stations.

When a subassembly is completed, it is put on a pallet and aligned with one of four power roller conveyors. Final assembly or storage is 6 to 200 away.

A rail transfer car with an automatic lift takes pallets from storage to the subassembly lines.

Finishing—At final assembly, conveyors are timed for an hourly production rate. Timing controls the movement of subassemblies, motors, and other parts.

For painting, motors travel about 1200 ft through degreasing, surface preparation, drying, spray booths, and final paint dryers. Motors are then lubricated and sent to final assembly. After subassemblies are attached, the motors are carried to inspection. Propellers, gaskets, and covers are installed after performance tests are passed. The motors continue by monorail through final inspection and packaging.

No Lifting—The packaging department is mechanized. Powered floor rails carry finished motors to the packers. When one motor is hoisted and removed, the rail system immediately positions another one in its place.

Cartons are prepared directly above the packing station. They drop down a chute and stop 5 ft above the packer. He puts the carton over the motor, turns it on a roll fixture and tapes the open end. Gas tanks are handled the same way.

Shipping—One man, operating a pushbutton console, picks any of ten models from a live roller conveyor and delivers it to a distribution or storage conveyor. Another man at a shipping dock console routes them to trucks or freight cars.

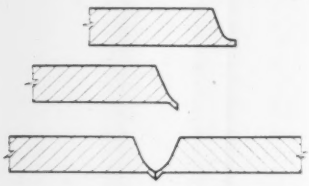
Welding Shortcut

A slight change in machining technique eliminates backup rings in pipe welds

A NEW technique eliminates the need for backup rings and inserts in pipe buttwelds.

It's based on correct preparation of the root edges of the joint. Stone & Webster Engineering Corp., Boston, developed the method.

Technique — The illustration shows the machining steps. The U-joint is machined somewhat deeper than normal. The long lip is bent down and faced parallel to the weld centerline. When the joint



THIS METHOD
. . . leaves root passes smooth

is butted, the lips form an internal projection which replaces an insert or ring. When the weld metal cools, shrinkage leaves the weld surface comparatively smooth.

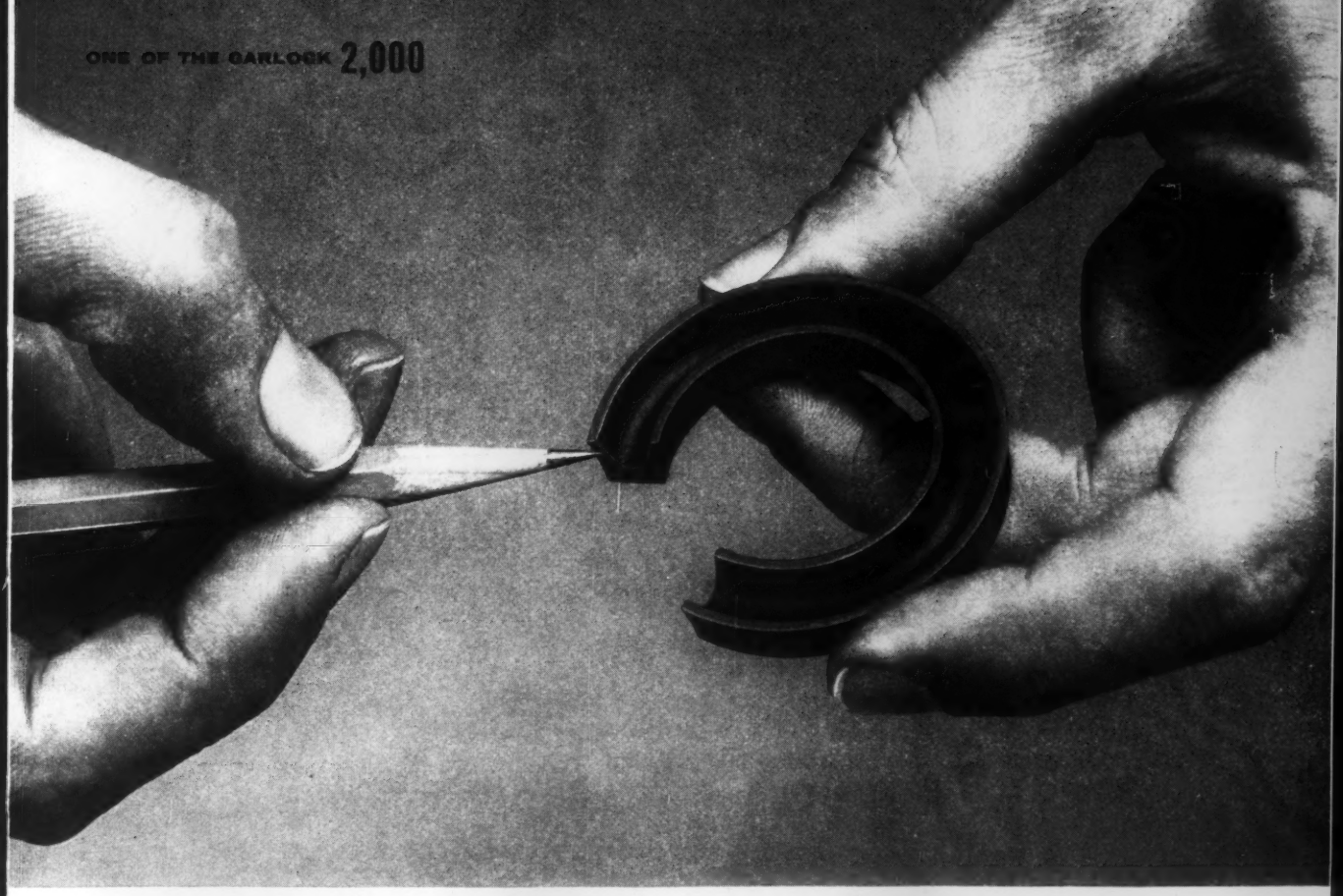
The firm uses an inert shielding gas to eliminate the concave condition peculiar to welds made without inserts. It also relies on an oxyacetylene flame or stress relieving coils to burn up paper dams.

Mill Rolls Clad Hastelloy

Now you can get four highly corrosion resistant alloys as clad plates, says Lukens Steel Co., Coatesville, Pa.

Research on rolling Hastelloys B, F, and C, and titanium on base metals has come to the point where the firm will consider experimental orders. As claddings, the metals are expected to cut costs in corrosion applications in chemical and plating industries.

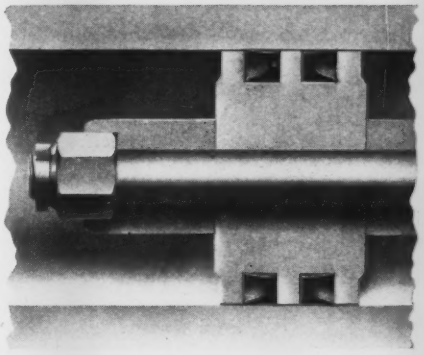
The cladding process uses heat and pressure to form a permanent bond between an inexpensive backing metal and special purpose alloys. The resulting sandwich has the same qualities as the premium metal at a cost considerably lower.



NEW FLARED-LIP U-CUP PACKING REDUCES FRICTION

Garlock's new homogeneous U-cups are designed for minimum frictional resistance in low pressure air or hydraulic cylinder applications. They are molded of synthetic rubber with flared sidewalls which also facilitate assembly, especially when cylinder bores vary slightly in size. Instantaneous sealing after sudden pressure changes is another advantage of the flared-lip design. Sizes $\frac{1}{2}$" O.D. to $3\frac{3}{4}$" O.D. are available from stock. Sizes to meet all AN6226 and JIC dimensional specifications.

Homogeneous U-cups are another part of the famous "Garlock 2,000" . . . two thousand different styles of packings, gaskets, and seals to meet all your needs. It's the only complete line . . . it's another reason you get unbiased recommendations from your Garlock representative. Call him or write for AD164.



The new Garlock 9511 U-cup Packing is recommended for pressures to 2000 psi. The flared-lip design creates an interference fit especially adaptable to applications involving sudden pressure changes. Clearance at the heel reduces friction, makes assembly easier.

THE GARLOCK PACKING COMPANY, Palmyra, N.Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

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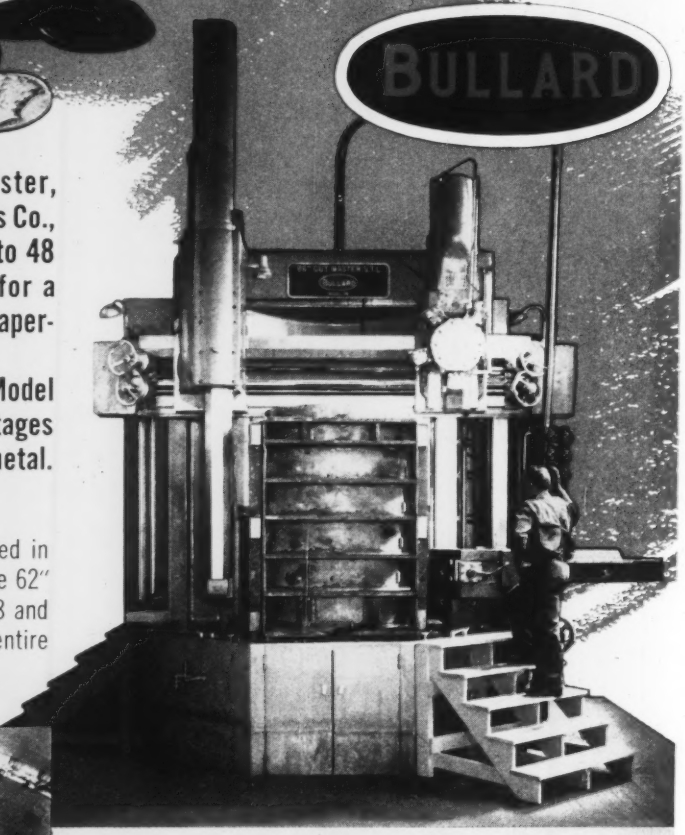
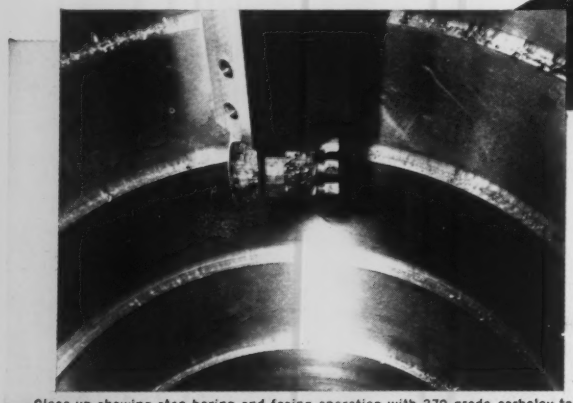


The new 66" Bullard Cut Master, Model 75 purchased by E.D. Jones & Sons Co., Pittsfield, Mass., has reduced from 65 to 48 hours the machining time required for a 4,000 lb. stainless steel piece used in a paper-making machine.

The Bullard Cut Master V.T.L., Model 75 line offers many features and advantages to help you — cut costs when cutting metal.

The part, 68" high, formerly had to be machined in three operations. Now, with an extension on the 62" Ram, a table speed of 9.6 r.p.m., feed of .0208 and 1/8" depth of cut, it is possible to machine the entire depth in one operation.



Close-up showing step boring and facing operation with 370 grade carboloy tool.

Complete details are available from your nearest Bullard Sales Office or Distributor or write

THE BULLARD COMPANY

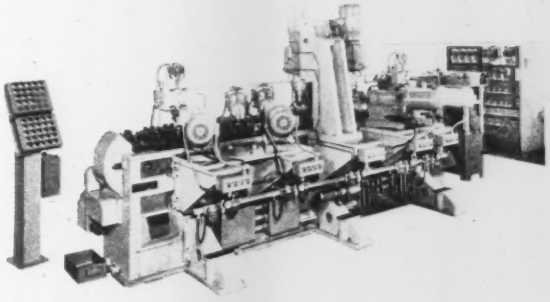
BRIDGEPORT 9, CONNECTICUT

Machine Does Multidirectional Work, Inspects Parts

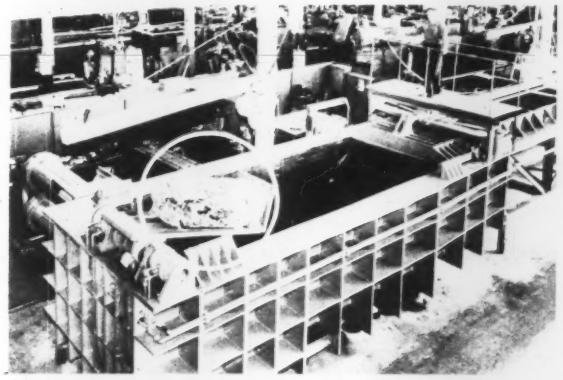
This transfer machine handles extrusions, permanent molds, die and sand castings, and forgings.

The unit has 20 machining stations. Fixtures can be approached by one or more work heads simultaneously. Machine bed tables support machining units and columns. Parts are manual or hopper fed, indexed through locking, work, and probe stations, unlocked, washed, air-dried, and ejected. A Geneva motion producing machine is incorporated in the unit.

A hydraulic unit powers fixture operations. A built-in system cools tools and washes chips into a motorized conveyor. *Write*: Jeffrey Machine Tool Div., Jeffrey Die & Engineering Inc., 23281 Telegraph Rd., Detroit 19, Mich. *Phone*: Kenwood 4-8280



Press Compresses Automobile Bodies into 15 Cu Ft Bales



An entire passenger automobile body is compressed into a bale measuring 16 by 24 by 60 in. by this machine in 1½ minutes (excluding charging time). The maximum load capacity of the unit is 693 cu ft.

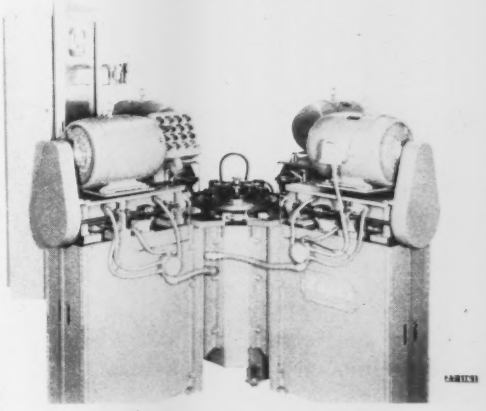
The unit is mounted on a simple foundation. A full flow, cushioned hydraulic circuit reduces line shock and hammer to a minimum. In operation, the lid slides shut and locks automatically, the gathering ram exerts a force of over 800,000 lb toward the hopper front, and a second ram moves in from the side with a force of over 1.2 million lb.

The door and the gathering ram can also operate on a half cycle, reducing time required to bale dense scrap. *Write*: Wheland Co., Signal Mountain Road, Chattanooga, Tenn. *Phone*: Amherst 5-3181

Four-Station Machine Has Range of Operations

This machine drills, reams, and countersinks parts from four sides simultaneously. It is adaptable to automation. The index table with four fixtures rotates parts between feed and return of the drill heads. After the parts are loaded and clamped, two holes are drilled 180 degrees apart. The unit indexes 90 degrees, two more holes are drilled and the two previous holes are reamed. The unit again indexes and the remaining holes are reamed. Cycling of the machine is automatic.

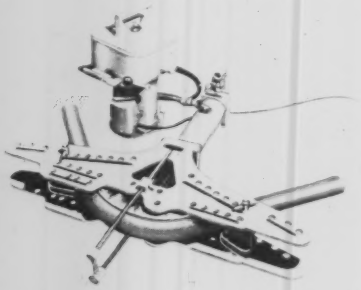
Each of the demountable feed units has its own hydraulic system. Power is 7½ hp at 1800 rpm. Thrust is 6000 lb at 1000 psi. Torque capacity is about 700 in.-lb. Feed is ¾ to 20 ipm, fast approach is 200 ipm, and return is 380 rpm. The unit cycles in 7 to 8 seconds. *Write*: Zagar Inc., 24000 Lakeland Blvd., Cleveland 23, Ohio. *Phone*: Redwood 1-0500



NEW PRODUCTS and equipment

Pump Develops 10,000 psi

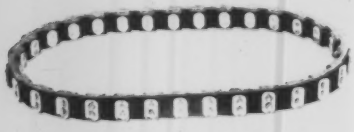
This portable pump can be used with hydraulic units, such as pipe benders or pushers. It can also be installed and adapted to furnish continuous power to existing equipment for pressing, pulling, pushing, or lifting.



The unit weighs 65 lb and is driven by a ½ hp, 1750 rpm electric motor. It is rated for 10,000 psi intermittent (or 5000 psi continued) duty, delivering 80 cu in. of oil a minute. *Write*: Tal Bending Equipment Inc., Milwaukee 2, Wis. *Phone*: Broadway 1-8676

Variable Speed Belt

Available in a complete range of sizes, this link drive belt is adjustable to any length. The unit is said to eliminate vibration. It min-



imizes downtime because it can be installed without dismantling machinery.

It is made of oil and heat resistant Neoprene. *Write*: Manheim Mfg. & Belting Co., Manheim, Pa.

Prevents Rust

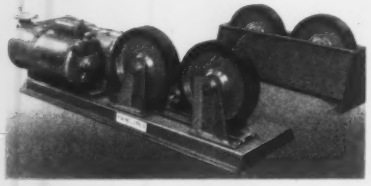
Protect-O-Metal No. 299, thinned with three to seven parts water, protects metal parts for at least two years of indoor storage.

It deposits a thin, transparent film which remains soft after the water evaporates. The coating will not re-emulsify after drying, and will not wash off in water or condensation once it has been applied.

This product is nontoxic, nonflammable in use, and practically odorless. The coating need not be removed prior to secondary machining operations or painting. *Write*: G. W. Smith & Sons Inc., 1700 Spaulding Rd., Dayton 32, Ohio. *Phone*: Clearwater 3-5114

Rotates Pipe

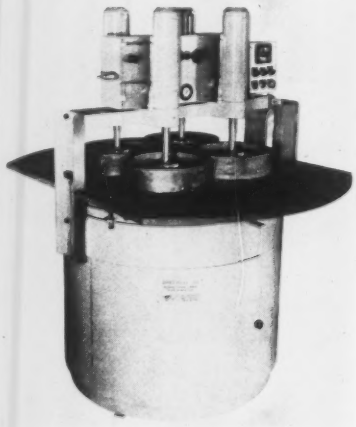
The Piper series of power and idler weldment turning rolls have variable speed drives connected to gear reducers. A knurled wheel turns the rubber tires. Welding speeds are 6 to 60 ipm. The units have a turning capacity of 6000 lb, a weight capacity of 6000 lb when used with two idler rollstands, or a 4000 lb load rating with one stand.



Model 3 rotates pipe from 3 to 36 in. OD. Model 10 handles pipe from 6 to 60 in. OD. *Write*: Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis 10, Mo. *Phone*: Prospect 6-6893

Finishes Steel or Plastic

Model 32 lap grinder is considered practical for degrees of finish from 32 to 1 rms and flatness from 1 hundredth to 2 millionths. Lap grinding uses loose grit, eliminating intermediate jobs of rough grinding



or even milling operations. Parts are ready for this unit when cast, sintered, stamped, or turned. It handles rough or finish work ranging from tough carbides and steels through ceramics and plastics.

A unique part handling system cuts costly machine idle time. *Write*: Abrading Systems Co., 8020 N. Monticello Ave., Skokie, Ill. *Phone*: Orchard 6-1500

Handles Are Removable

Model 10-6241-65, all-purpose platform truck, is mounted on two swivel and two rigid casters for easy maneuverability.

With the handles on, it may be pushed or pulled. The handles aid in the support of bulky material. If one handle is removed the truck can carry larger packages than the 16 by 30 in. limitations imposed when they are both in place. With both handles removed it will transport large flat-stacked material, such as wallboard.

The truck has a 16-gage steel platform and is entirely surrounded by a heavy duty, nonmarking rubber bumper. It has rubber-tired wheels and a load capacity of 800 lb. *Write*: Colson Corp., Elyria, Ohio.

Swing Cutoff Machine

This machine makes it possible to store material and have it automatically feed stopped clamped. This is done by air as the operator swings the cutting head into position.

Ferrous materials cut with abrasives, or nonferrous materials cut with a metal wheel and mist coolant system, may be worked with this unit.

Round tubing or pipe up to 1.9

cool metal for hot planes

For jet and rocket aircraft engines, wings and surfaces that are subject to extreme conditions of heat, friction and corrosion, where the metal *must stand up* . . . design it, improve it and protect it with McLOUTH STAINLESS STEEL.

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for aircraft

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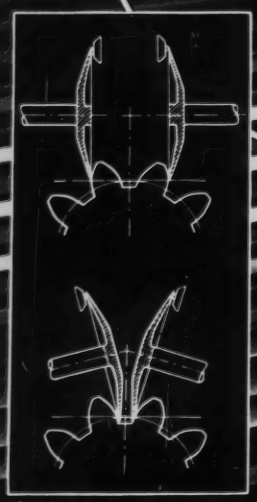
NOW—PRECISION GEAR GRINDING at phillie gear



Single point grinding method eliminates burning or cracking of tooth surface.

...assures the ultimate in hardened gear accuracy, practically silent operation

Long years of experience have clearly shown that ground tooth gears can transmit higher loads than gears manufactured by conventional methods. Precision gearing properly hardened and ground can be reduced 60% in size, while service life is increased.

Phillie Gear has now installed the latest gear grinding equipment for spur and helical gearing up to 26" diameter, with tip root relief and crowning available. Similarly, spiral bevel, zerol, and hypoid gearing can be precision ground up to 23" diameter.

For an engineered recommendation, send your precision gearing problems to Philadelphia Gear Works.

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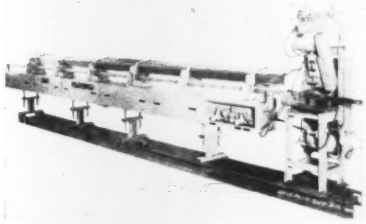
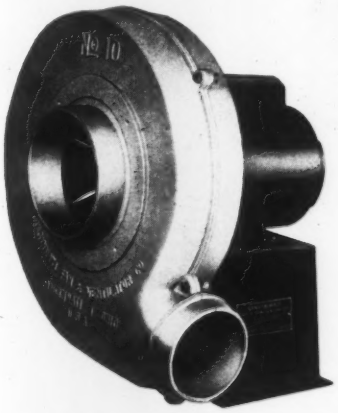
NEW PRODUCTS and equipment



in. may be cut and a 12 or 14 in. wheel may be used. *Write*: Wallace Supplies Mfg. Co., 1300 Diversey Parkway, Chicago 14, Ill. *Phone*: Buckingham 1-7000

Self-Cleaning Blower

Model PB utility blower is available in four sizes and four discharge positions. It is fitted for direct drive with the housing attached to a flange type motor to be used with or without a pedestal. A self-cleaning



wheel handles difficult materials. Other features include sparkproof construction, and permanently lubricated, ball bearing motors. *Write*: Cincinnati Fan & Ventilator Co., 3548 Montgomery Rd., Cincinnati 7, Ohio. *Phone*: Jefferson 1-1742

Costs Less, Cures Cooler

Through chemical modification of the resins in the original Duracron, Series 100, thermosetting acrylic baking enamel, these new resins (Series 200 and 300) are more economical and can be baked at lower temperatures—30 minutes at 300° F or equivalent. They are recommended for interior uses only.

The 200 series is hard and stain-proof. Because of its high gloss and protective resistance, it can be used as a one-coat finish.

The 300 series is the most economical, costing no more than ordinary alkyd-amine finishes. It is more flexible than the 200 series but has neither the stain nor chemical resistance of that enamel.

Duracron is available in clear, white, or colors. *Write*: Industrial Finish Sales Div., Pittsburgh Plate Glass Co., 632 Ft. Duquesne Blvd., Pittsburgh 22, Pa. *Phone*: Atlantic 1-5100

Eliminates Weld Porosity

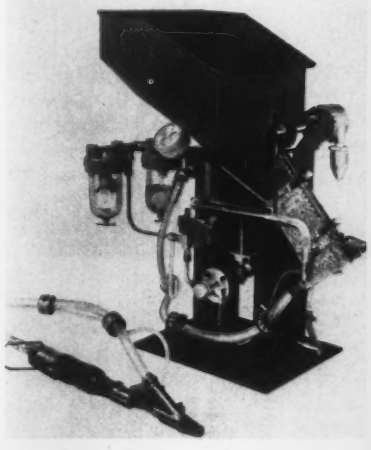
Special chlorine-inert gas mixtures for Mig welding (STEEL, Mar. 24, p. 128) are available. They eliminate porosity in heavy plate welding of aluminum or magnesium alloys where more than one pass is needed.

The two standard mixtures are: 97 per cent argon, 3 per cent chlorine, for flat welding, and 97 per cent helium, 3 per cent chlorine for vertical and overhead work. *Write*: Matheson Co. Inc., P.O. Box 85, East Rutherford, N. J. *Phone*: Webster 3-2400

Feeds Screws to Driver

The Jet-Setter uses a tapered (conical) plastic covered head for automatic driving of threaded fasteners in confined locations. It can be used at any angle to drive screws, including those with preassembled washers, and prevents the marring of finished surfaces.

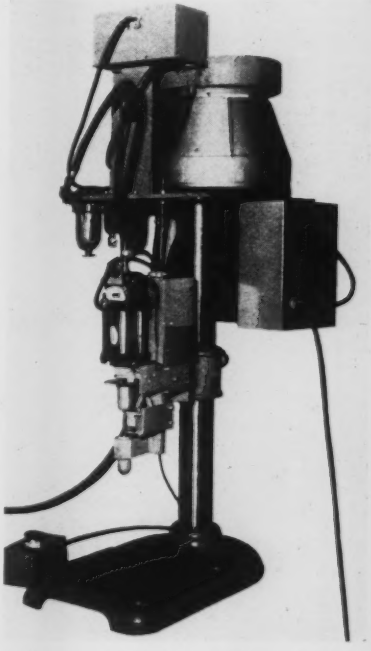
The unit is adaptable to all types of power drivers and has a pneu-



matic control which permits only one screw at a time to be fed to the driving head. The screw acts as its own finder or drift. *Write*: Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.

Threaded Insert Assembly

This automatic machine locates and anchors expansion inserts in drilled or molded holes. It can be adapted to existing setups such as arbor and foot presses.



It consists of a vibratory feed hopper, an orientating unit, and an air cylinder.

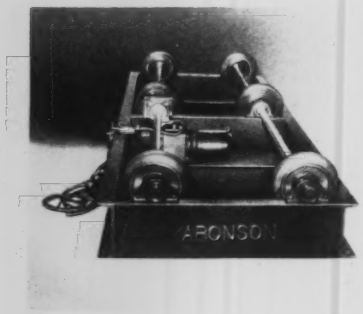
Capacity of a single punch machine is 72 inserts a minute. The machine can be tooled to run as many as six inserts at one time. *Write*: Phelps Mfg. Co., P. O. Box 542, Westport, Conn. *Phone*: Capital 7-6182

Weldment Turning Rolls

Featured are various sizes of rubber and steel tires with taper lock hub bushings. Wheel adjustments are made without driveshaft keyways. The rolls are powered by heavy duty worm-gear drive and variable speed transmissions (range: zero to 100 ipm).

These rolls have load capacities up to 20,000 lb, handle cylindrical

NEW PRODUCTS and equipment



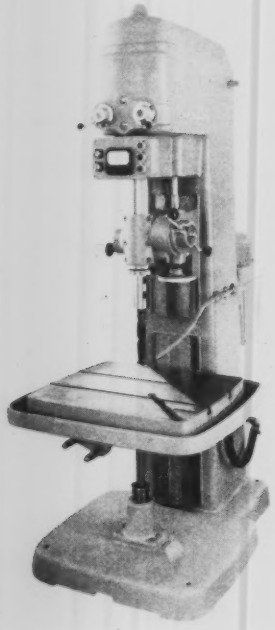
vessels from 3 in. to 6 ft in diameter, and take lengths to 20 ft.

All models have safety disconnect switches, magnetic reversing starters, and 20 ft remote control positions. *Write*: Aronson Machine Co., Arcade, N. Y.

Drilling Machines

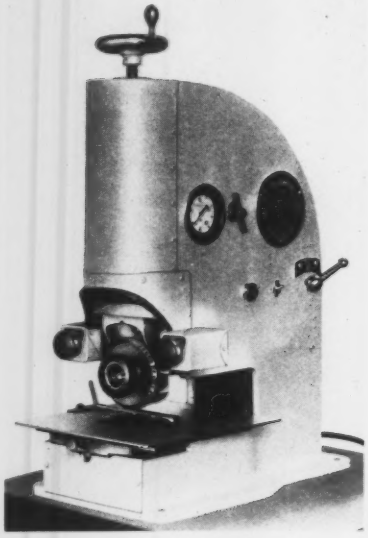
Medium duty units in 16 and 24 in. sizes have capacities of 1 in. in cast iron. They are built in single and multiple spindle, floor, bench, and production box column models. Heavy duty, 1½ in. capacity, 21 and 25 in. sizes come in box and round column, single and multiple spindle floor types.

Speed ranges are from 450 to 3000 rpm on medium duty machines and from 60 to 1825 rpm on the heavy duty drills. Power feed rates are from 0.002 to 0.015 in. *Write*: Cincinnati Lathe & Tool Co., Cincinnati 9, Ohio. *Phone*: Redwood 1-2121



Stamps Nameplates

Pneumatically operated, this stamper requires at least 40 lb pressure. A self-contained regulator allows the operator to select the pressure desired. He must use both hands to cycle the unit, which stamps up to 60 characters per minute.



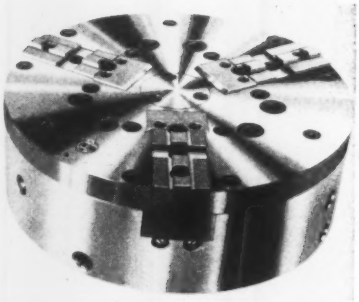
The unit will mark plates of varying hardness from soft brass to stainless steel. It accommodates plates up to 6 by 8 in. from 0.012 to 0.062 in. thick. *Write*: Geo. T. Schmidt Inc., 4100 Ravenswood Ave., Chicago 13, Ill. *Phone*: Eastgate 7-0300

Chuck Takes Up for Wear

This chuck is for higher spindle speeds taking full advantage of high speed cutting tools, but can be used on any automatic. A midsection of aluminum and better design of hardened jaws reduces the weight 40 per cent.

This means easier starts, quicker stops, and less centrifugal effect for better maintained gripping at high speeds.

The outstanding feature of this chuck is the takeup for wear provided by two tapered gibs that work on tempered keyways under each jaw.



These units are available in two and three jaw designs in 6½, 8¼, 10, and 12 in. diameters. *Write*: Buck Tool Co., 2015 Schippers Lane, Kalamazoo, Mich. *Phone*: 2-0171

Cuts Metal Cutting Costs

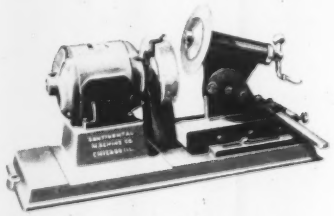
A percentage of reclaimed material is processed into an economical carbide, permitting sale at prices much lower than those for most general purpose carbides.

This product is available in Grade S-35 (Carbide Industry Code, C-6) for steel, and C-35 (Carbide Industry Code, C-2) for cast iron and nonferrous metals.

It is stocked in standard sizes and styles for throwaway toolholder inserts and milling cutting blades. Special molded blanks will be furnished subject to quotation. *Write*: Newcomer Products Inc., Latrobe, Pa.

Cutoff Wheel Grinder

This rotary bench grinder sharpens pipe and tube cutoff wheels. It has a manual bevel adjustment and setscrew stop that permits equal



length bevels on both sides. The adjustable base compensates for grinding wheel wear.

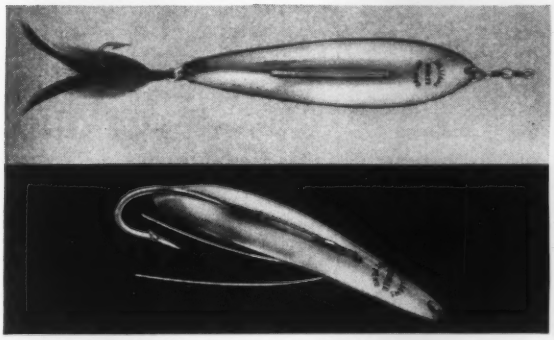
Wheels up to 8 in. can be sharpened. *Write*: Continental Machine Co., 2345 W. Nelson St., Chicago 18, Ill. *Phone*: Eastgate 7-8831

NEW BRASS CUTS POLISHING COST

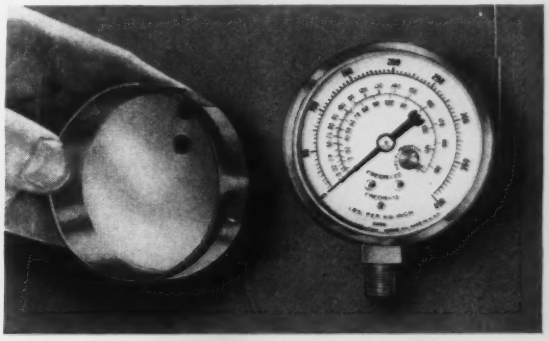
also gives you clean, easy drawing and forming, plus higher physical properties—Formbrite,® Superfine-Grain Drawing Brass by Anaconda

AIRGUIDE Instrument Co., Chicago, gets high luster finish on bezels for its famous weather instruments at 50% lower cost since it switched from ordinary drawing brass to Formbrite. Airguide does the presswork—says Formbrite "draws and forms excellently." Driscoll & Co. (above) polishes the bezels.

BAROMETER in Chippendale style, "Mayfair," is one of the broad line of brass-trimmed instruments made for home and marine use by Airguide.



FISHING LURES made by Williams Gold Refining Co., Inc.—"Wabler," top and "Weedler," below—are polished for plating by tumbling. Switching from ordinary yellow brass to Formbrite cut costs more than 40%.



MARSH Instrument Co., Skokie, Ill., dropped a finishing operation and gets a "mirror finish" with a light buff, by using Formbrite. Marsh reports that finishing cost was cut 40% and that forming is "excellent."

Wherever finishing is an important cost factor in formed or drawn products, Formbrite in sheet and strip is designed to save you money. In brass wire alloys for cold-heading and upsetting, it gives a stronger, springier, more abrasion-resistant product. For more detailed information, write for Publication B-39. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

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FORMBRITE

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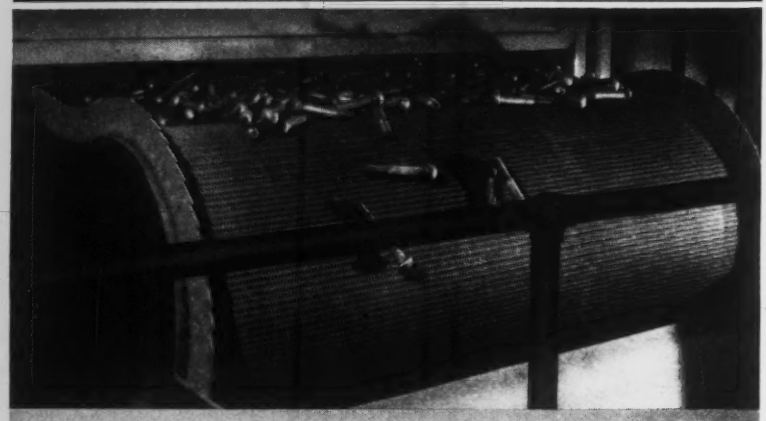
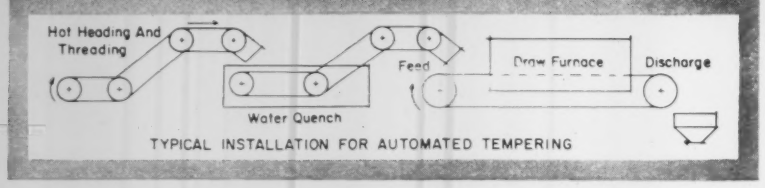
Cambridge WOVEN WIRE BELTS





TYPICAL INSTALLATION FOR AUTOMATED TEMPERING

METAL-MESH BELTS RESIST WARPING OR BUCKLING—CUT COSTS IN CONTINUOUS HEAT TREATING

Moving thousands of pounds of bolts per hour through 1150° F. temperatures is a cinch for rugged Cambridge Woven Wire Belts because they're designed to take high temperatures with a minimum of operating trouble and maintenance. And, open mesh construction assures high product uniformity. Furnace heat flows through the belt and around product for fast, thorough processing.

In cleaning, brazing, oiling and quenching operations, too, Cambridge Belts help increase production and maintain high product uniformity. Here's how:

CONTINUOUSLY MOVING BELTS ELIMINATE BATCH PROCESSING give faster, less costly production; reduce slow, costly manual handling.

ALL-METAL CONSTRUCTION IS HEATPROOF, COLDPROOF, ACIDPROOF —Cambridge Belts can be woven from any metal or alloy to take sub-zero or up to 2100° F. temperatures, yet remain impervious to attack from water, acids or caustic solutions.

OPEN MESH PROVIDES FREE AIR, LIQUID CIRCULATION—gives more uniform heating, cooling, drying; permits flash drainage of solutions, rapid washing, quenching and cleaning.

SPECIAL SURFACE ATTACHMENTS AVAILABLE—raised edges or cross flights to hold product on belt during movement.

Talk to your Cambridge Field Engineer soon—he'll explain the many advantages of continuous heat treating on Cambridge Woven Wire Belts. He'll recommend the belt size, mesh or weave—in the metal or alloy—best suited to your operations. You'll find his name in the classified phone book under "BELTING, MECHANICAL". Or write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.

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WIRE CLOTH | METAL-MESH CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

Department J, Cambridge 32, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

NEW literature

Write directly to the company for a copy

Worm and Gear Mountings

Mountings for double-enveloping worm gearsets are described in Bulletin 750-C. Included are bearings, caps, carriers, and seals. Cone-Drive Gears Div., Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.

Cutoff Wheels

"Which Abrasive Cutoff Wheel Is the Right Wheel" is available until May 30. Wallace Supplies Mfg. Co., 1300 Diversey Parkway, Chicago 14, Ill.

Welding Machines

This 15 by 23 in. troubleshooting and maintenance chart is for both alternating and direct current machines. Advertising Dept., Welding Div., A. O. Smith Corp., Milwaukee 1, Wis.

Heating Equipment Rental

Induction heating equipment on a rental basis is described in this brochure. It outlines advantages of various lease plans available for both large and small companies. Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y.

Timing Belt Catalog

TB-58 covers engineering and user information on 1/5, 3/8, 1/2, 7/8, and 1¼ in. timing drive pitches. Morse Chain Co., Ithaca, N. Y.

Metal Treating

"A Guide to Chemical Treatments of Metals" describes various chemical conversion coatings for corrosion resistance, paint bonding, drawing and forming, and protection for friction surfaces. American Chemical Paint Co., Ambler 1, Pa.

Power Supply and Arc Welder

This brochure lists the advantages of having a portable welder that also supplies electrical power. Lincoln Electric Co., Cleveland 17, Ohio.

High Alumina Ceramics

This catalog contains information on the physical properties and characteristics of Diamonite as well as catalog sheets and other technical information for purchasing and design engineering personnel. Diamonite Products Mfg. Co., 1232 Cleveland Ave. N. W., Canton 3, Ohio.

Spring Lock Fasteners

Detailed specifications, engineering drawings, applications, and installation information are provided in this catalog. Sales Dept., Simmons Fastener Corp., N. Broadway, Albany 1, N. Y.

Bearings

Design requirements for antifriction bearings of unusual shapes and sizes are described in Bulletin AFB-2. Included is current information on suitable bearing

NEW LITERATURE . . .

component materials for high temperatures, corrosion resistance, nonmagnetic properties, and other specialized operating conditions. Industrial Tectonics Inc., 3686 Jackson Rd., Ann Arbor, Mich.

Fire Control

This brochure, "Safety Code for Inspection, Maintenance, and Protection of Fixed Foam Systems," outlines the three most popular types of foam systems in use—chemical, indoor, and outdoor. Fire Equipment Manufacturers' Association Inc., Suite 759, 1 Gateway Center, Pittsburgh 22, Pa.

Free Color Code Kit

This kit supplies all materials and data necessary to design a successful color coding system. Dept. SLC, Crown Industrial Products Co., 1001 Amsterdam St., Woodstock, Ill.

Blast Cleaning

This 28-page handbook, No. 143-D, covers blast cleaning, finishing, and shot peening, utilizing the airless abrasive blast method. A special section is devoted to application of airless abrasive blast equipment. Wheelabrator Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Vises and Fixtures

ASTE data sheets, No. 34-93150, list the specifications and dimensions of three-way machine units, rotary tables, adjustable lathe fixtures, and other equipment. Universal Vise & Tool Co., Parma, Mich.

Fasteners

Two bulletins give the specifications and test data on QAF stressed panel fasteners. Included are special features. Installations for both flush and protruding head types are shown. Waldes Kohinoor Inc., Long Island City, N. Y.

Plant Tour

An illustrated booklet describes this modern plant and its operations in detail. Empire Steel Castings Inc., Reading, Pa.

Laboratory Machining

This brochure describes equipment with a machining range from soft aluminum to nickel and cobalt base alloys. Sieburg Industries Inc., Horse Plain Road, New Britain, Conn.

Arc Welding

Twecolog No. 11, a 12-page catalog, describes arc welding cable connections and accessories. Tweco Products Inc., P. O. Box 666, Wichita, Kans.

Flame-Cutting Machines

Form 4487, a 28-page catalog, describes machines ranging from small portables to large multiblowpipe shape-cutters. Linde Co., division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

Control Pyrometer

Bulletin No. 1053 describes an indicating-controlling pyrometer requiring less than ⅓ sq ft of panel space. Included are indicator and controller specifications, and wiring diagrams of units in use. Illinois Testing Laboratories Inc., 420 N. LaSalle St., Chicago 10, Ill.

Grinding Wheels

A brochure, PG-350, describes features and application of these wheels for cutter and tool grinding. It includes a table of starting grades for toolroom grinding operations. Cincinnati Milling Products Div., Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

Laboratory Rupture Tester

This brochure describes a creep unit, designed for laboratories testing small specimens or using light loads. Arcweld Mfg. Co., P. O. Box 311, Grove City, Pa.

Pneumatic Pull Tools

Form 8-421, a 6-page catalog, details five basic units available for fastener installation. A fastener reference table is included. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

Architectural Aluminum

A new version of the Alcoa Architectural Stocks Catalog is available. Besides listing stocks, it provides information on properties, specifications, and finishes. Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.

Press Machine Vises

Described in Catalog 691 are vises that are machined top, bottom, and sides for

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the Sensational NEW
miller
GOLD STAR
SR

It DELIVERS maximum arc stability for:
a. Sounder, denser welds – and more of them – in less time, with . . .
b. ALL electrodes, in . . .
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How is this performance possible? THE MILLER GOLD STAR SR introduces a . . .
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plus
NEW weld stabilized current
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Tested across the country by practical, critical, hard-bitten working weldors, here's what they say about the new Miller GOLD STAR SR:
"it's the DC performance I've always wanted"
"here's DC welding current that's . . . perfect!"
"positively handles ALL electrodes better"
"best deal I've seen for v and o work"
"easiet arc starting in my experience"
"smoothest arc I ever used . . . and . . . quiet!"
"it's just plain the MOST"
Complete particulars on the MILLER GOLD STAR SR, including inert gas and automatic fixture welding, is now available on request.

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Chandler's step-by-step production control and rigid inspection standards assure accuracy, precision and uniformity to meet the most exacting specifications. Using high carbon, alloy, super-alloy and stainless steels, Chandler produces top-quality bolts with special heads or threads, drilled heads or shanks for the automotive, engine and aircraft industries.

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NEW LITERATURE . . .

accurate 90-degree hole drilling without a fixture. Included are air-hydraulic units for automatic production and heavy duty vises. Wilton Tool Mfg. Co. Inc., Schiller Park, Ill.

Diamond Wheels

This catalog-manual contains information on diamond wheels and grinding techniques. Clipper Diamond Tool Co. Inc., 345 Hudson St., New York 14, N. Y.

Gear Generators

Bulletin 460 presents specifications and helpful information on Farrel-Sykes gear generators. Farrel-Birmingham Co. Inc., Ansonia, Conn.

Stabilized Ceramics

Technical Bulletin 686 NP 1 describes the three Crystolon ceramics offering high resistance to thermal shock and extreme temperatures. New Products Dept., Norton Co., Worcester 6, Mass.

Stainless Steel Fittings

Catalog 50.0 lists sizes, materials, and applications of seal rings, elbows, and tee couplings. Adapters and reducers are included. Vanton Pump & Equipment Corp., division of Cooper Alloy Corp., Hillside, N. J.

Industrial Cranes

Bulletin CR-610 is an industrial crane catalog. It covers cranes, hoists, trolleys, girders, and controls. Ederer Industrial Cranes, 2931 First Ave. S., Seattle 4, Wash.

Punches and Dies

Stocks of punches and dies to fit most punch presses are described in these sheets. Charts and instructions help to determine clearances for both type and thickness of work. A decimal die marking system makes die selection easy. T. H. Lewthwaite Co. Inc., 311 E. 47th St., New York 17, N. Y.

Roller Pipe Cutters

Bulletin D-69-6 details company equipment in manual, air, and automatically operated models. Landis Machine Co., Waynesboro, Pa.

Hydraulic Cylinders

Bulletin 71000 contains illustrations and installation information on a line of 2000 psi double-acting hydraulic cylinders. Oilgear Co., 1571T W. Pierce St., Milwaukee 4, Wis.

Shipping

"Your Handy Helper" is a guide to shipping methods and supplies. Diagraph-Bradley Industries Inc., P. O. Box 269, Herrin, Ill.

Superalloy Tubing

Corrosion-resistant alloys that will not rupture under stress loads of 25,000 psi at 1200° F during 1000-hour test periods are listed in Bulletin 70. Chemical com-

NEW LITERATURE . . .

position, properties, production limits, tables, and graphs are included. Superior Tube Co., 1585 Germantown Ave., Norristown, Pa.

Disc Grinders and Grinding

This condensed catalog gives past and present data on surface grinders and abrasive materials used. Gardner Machine Co., Beloit, Wis.

NEW BOOKS

Stainless Steel Fabrication, Advertising Dept., Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa. 386 pages, no charge when requested on company letterhead.

This book covers cutting, joining, forming, machining, and treating of steel. It details methods for metal fabrication. Included are over 140 photographs, 120 charts and graphs, 200 special diagrams, and several tables on stainless steel.

Basic Motion Timestudy, Gerald B. Bailey and Ralph Presgrave, McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. 224 pages, $5.

Easy to read, this practical manual combines the theory of motion and timing with a workable method of application. The uses and misuses of time study principles are given in detail. Problems of methods analysis, development of standard time data, and motion patterns used in research are also covered in separate chapters.

Strategy and Tactics in Labor Negotiations, Edward Peters, National Foremen's Institute, a division of Vision Inc., 100 Garfield Ave., New London, Conn. 266 pages, $4.50.

This book will aid any negotiator. It is informative, easy to read and understand. Examples of present day practices—good and bad—are included.

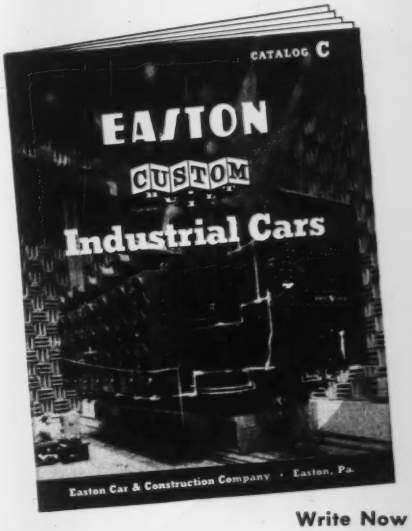
Sheet and Plate Product Information, Technical Publications Dept., Kaiser Aluminum & Chemical Sales Inc., Chicago 11, Ill. 320 pages, $5. (No charge if requested on company letterhead.)

Description, attributes, and processing information on aluminum and its alloys are presented in this handbook. It is an aid in the selection and use of aluminum sheet and plate alloys. Chapters are included on fabricating, handling and storing, and surface finishes.

Engineering Data on Thread and Form Rolling, Reed Rolled Thread Die Co., P. O. Box 350, Worcester 1, Mass. 87 pages, $1.50.

This booklet contains technical information on thread and form rolling for engineering, manufacturing, and inspection departments. It includes cross reference tables.

IDEAS for heavy duty materials handling



CUSTOM BUILT TRADEMARK

EASTON CATALOG C describes 39 different types of heavy duty EASTON industrial cars and trailers, with capacities from 2 to 500 tons, including motorized and automated units, for handling all kinds of loads.

IDEAS inspired by EASTON CATALOG C may save important time and money in your heavy handling operations.

A-1061

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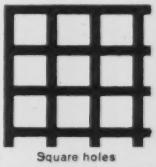
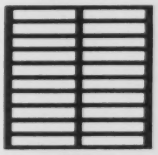
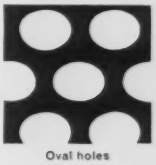
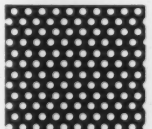

Square holes

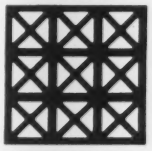

Slots


Oval holes

THOUSANDS OF DIFFERENT PATTERNS AVAILABLE


Round holes

Oblong holes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Market Outlook

AS THEY begin the second quarter, steelmakers pin their hopes for improved sales on these factors: 1. They've been producing less steel than fabricators have been using. 2. Consumers' inventories may soon hit rock bottom. 3. Better weather should bring an upturn in construction. 4. Government action may bolster consumer confidence.

PRODUCTION LAGS— During the quarter just ended, the industry produced about 18.4 million net tons of steel for ingots and castings. It was the smallest output for a nonstrike quarter since the second quarter of 1946, when production was 15.6 million tons. Last week, steelmaking operations dropped 2 points to 50.5 per cent of capacity, hitting a new low for the year. Production was about 1,363,000 tons.

UPTURN BY MIDYEAR?— While first quarter steel output fell 40 per cent from the year earlier level, industrial production—as measured by the Federal Reserve Board index—dropped only 11 per cent. Citing those statistics, Joseph L. Block, president of Inland Steel Co., predicts an upturn in steelmaking operations by midyear. The industry has been operating at a much lower level than the economy in general, he says, and steel inventories have been drastically reduced.

NO HELP FROM DETROIT— If there's to be a pickup soon, it will get no impetus from the automotive industry. Several sources indicate that the 1958 model run will wind up in June to allow car dealers to work off their inventories. This would mean nothing but spot buying throughout the second quarter. Ford Motor Co.'s steel mill is down for three weeks. It's reported that the company has enough finished and semifinished steel on hand to build 200,000 cars.

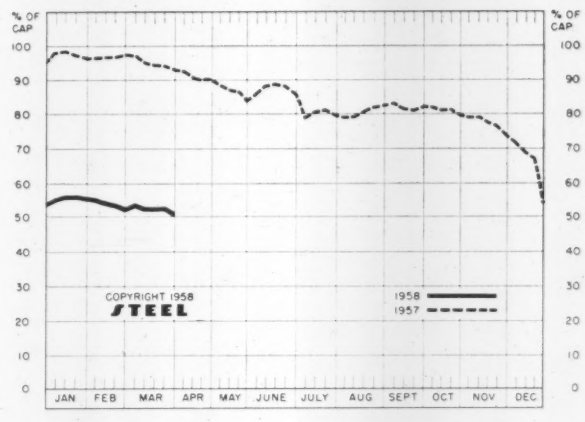
SPRING'S A LITTLE LATE— In the absence of strong automotive demand for steel, construction assumes paramount importance. To date, seasonal gains have been disappointing—mainly because of poor weather. The highway program is still largely dormant, and bridge building is slow. There has been a slight pickup in demand for structurals, but it isn't being felt by the mills. Reason: Fabricators have ample inventories.

RAILROAD ORDERS OFF— There's almost no demand for steel rails, and carriers are ordering few freight cars. They feel they're well equipped to handle as much traffic as they're likely to get during the next few months. In February, they took delivery of 6316 cars and ordered 294 (vs. 401 in January). Not since 1949 have February orders been so low. On Mar. 1, the freight car backlog was 43,750, against 111,965 a year ago.

TUBULAR OUTLOOK GRIM— "The oil country goods market is shot to hell; trunk line pipe is dead; and March doesn't look a bit better than February," complains a tube sales manager. Blaming his difficulties on oil imports, the Memphis Case decision, and bad weather, he mentions still another problem: Major oil companies are unloading at cost pipe which they bought prior to the Aug. 1, 1957, price increase.

TIN PLATE SHINES— "We can see excellent operations through the first half," reports a tin plate sales manager. "Canned soft drinks are gaining favor, and during a recession, people eat more canned foods—more baked beans and evaporated milk."

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Mar. 30	Change	Same Week 1957	Same Week 1956
Pittsburgh	54.5	— 1.0*	93.5	103
Chicago	53.5	+ 1.0*	88.5	97.5
Mid-Atlantic	51.0	— 2.0	95	98
Youngstown	47.0	0	91	94
Wheeling	72.5	— 0.5	79.5	98
Cleveland	30.0	— 1.0*	92	94
Buffalo	37.0	+ 0.5	100	105
Birmingham	47.5	0	99	93
New England	52.0	— 1.0	65	86
Cincinnati	53.0	— 0.5*	72	93
St. Louis	70.0	— 3.0	99	100
Detroit	28.0	—14.0*	96	102
Western	67.0	0	106	103
National Rate	50.5	— 2.0	93	98.5

INGOT PRODUCTION‡

	Week Ended Mar. 30	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	84.8†	88.2*	91.8	147.2
NET TONS (In thousands)	1,363†	1,417*	1,475	2,364

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

Metalworking Outlook—Page 41 Technical Outlook—Page 79

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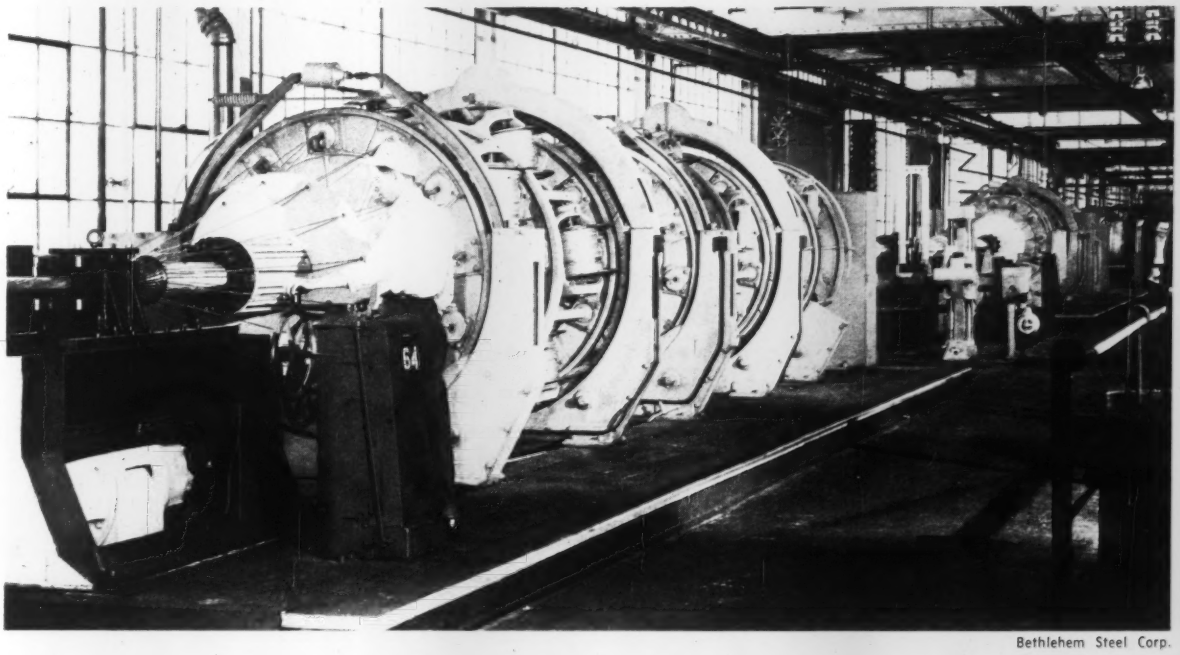

Bethlehem Steel Corp.

Strander production uncertain as . . .

Wire Rope Sales Lag

SALES AND PRODUCTION of wire rope are slack, but most producers are predicting a comeback during the second half. Sales in 1957 averaged 15 per cent under 1956 figures, but industry sources indicate 1958 sales should equal those of 1956.

Demand — Replacement orders account for 80 to 85 per cent of the wire rope market, most industry spokesmen agree. During the current slump, demand from original equipment manufacturers has slipped badly. Some manufacturers report it is down as much as 50 per cent from what it was at this time last year. Some small applications (such as overhead garage doors) show increases, but the market is off 10 to 15 per cent in almost every other direction. To make matters worse, imported wire rope is a major competitor to U. S. manufacturers—so much so that one supplier is thinking about adding this thought to his advertising: "Buy American Made Wire and Keep Americans Working."

Results: Most producers are operating at 50 to 70 per cent of capacity. Demand could pick up significantly, even double, without seriously straining production. There are scattered exceptions, but only one maker reported production above 70 per cent of capacity. Most are working at close to 50 per cent.

Prices—The industry is highly competitive. Prices fluctuate continually. But despite recession cutbacks, prices are roughly the same or slightly above what they were at this time in 1957—however, they'll probably go up soon. Wire rope manufacturers are keeping a close eye on steel prices. If steel goes up when the United Steelworkers contract is renewed, wire rope prices will be increased.

Base prices haven't been lowered (industrywise) during the slump, but profits have taken a beating. Competition has forced sellers to give longer discount terms.

Sales Outlook — Manufacturers are talking a sales comeback in 1958, but no one seems to know where it will come from. Sales to the oil and gas industry are expected to go down. Commercial construction equipment sales will probably do no better than break even. The industrial construction market should be about 35 per cent below what it was last year. Bridge and road building consumption will vary in different parts of the country, but over-all, it'll probably be about what it was last year. Material handling equipment is expected to take 25 to 30 per cent less wire rope this year than last. Mining uses are expected to drop 25 per cent. Military uses should remain stable.

Market Help—Use of prestressed wire rope in concrete slabs is expected to mushroom in the next few years, but it probably won't expand quickly enough to help much this year.

One thing could bring the industry back in a hurry: Production will boom if the nationwide highway program gets into high gear. The lag in the program partially explains why sales are down. Mak-

ers of road building equipment expected large-scale highway building last year; they overproduced and are stuck with large inventories. So they're not placing many new orders for wire rope.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 128 & 129

There's not much change in the light, flat-rolled steel market. Improved demand from certain areas of consumption appears to be offset by slackening in others. Over-all, the market appears to be marking time, pending a seasonal pickup in requirements for construction and related lines.

Not much, if any, improvement in buying on automotive account appears in early prospect. Some Pittsburgh mills think the automakers have about completed their ordering for production of 1958 models. To some extent, this is borne out by reports from Detroit that the 1958 model runs may wind up in June to allow car dealers to work off inventories. The auto builders won't confirm this report, but should it prove true, it would mean they would do little more than spot buying throughout the second quarter.

Galvanized sheet requirements are up some, but lagging demand from the sanitaryware and household appliance manufacturers continues. Actually, cutbacks in automotive work seem to be offsetting all gains in demands from other consuming directions. Detroit sellers report cold-rolled sales to appliance makers are up.

Demand for sheets and strip from smaller New England buyers is up slightly. It is largely attributed to depleted inventories. Most buying is for prompt shipment. Tonnage is readily available.

The Youngstown plant of the Strip Steel Div., Jones & Laughlin Steel Corp., has been closed for two weeks because of a lack of orders. It resumes Apr. 6. Republic Steel's Truscon Steel Div. at Youngstown has resumed operations after a one-week shutdown.

Republic Steel Corp., Cleveland, has made some slight revisions in its extra card on galvanized coils, flat sheets, formed roofing, siding and accessories, corrugated culvert sheets, and galvannealed sheets. The revised card became effective Mar. 21, superseding one dated Aug. 19, 1957.

Steel Bars . . .

Bar Prices, Page 127

Carbon and alloy bar business is dragging bottom. Consumers' inventories are low. Some producers are getting a few more orders, though they are smaller, on the average, than they were some time back. Most makers note no over-all gain in demand, and few anticipate much improvement over the next several weeks, though most think consumption is outrunning buying, and that consumers' inventories are steadily shrinking.

With shipments of most carbon grades possible within two weeks, buyers are ordering for immediate requirements largely, and in practice, producers are carrying their customers' inventories in many sizes. Stocks of some New England forge shops are heavier than those of

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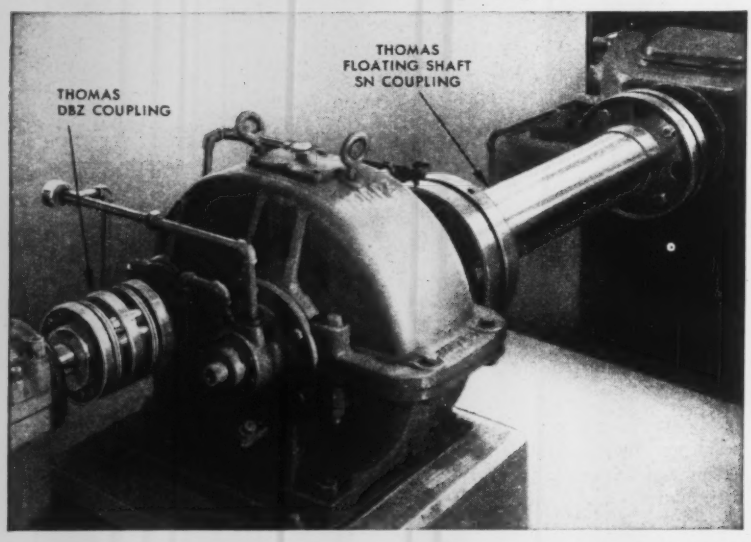

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most area consumers.

In the Midwest, the mills are receiving orders so close to leadtime deadlines that it is hard to appraise the outlook for any period ahead. March shipments are expected to about equal February's, and not much change in volume is indicated for April. Shipments to the farm equipment makers are relatively good, but conditions in that industry are spotty, some companies operating at higher rates than others.

Pig Iron . . .

Pig Iron Prices, Page 132

There is no improvement in demand for merchant pig iron and coke with foundry operations increasingly spotty. Buying failed to pick up noticeably during March, and the outlook for betterment in April is uncertain since demand for castings show no signs of early improvement. Some sellers describe March business as the slowest in years.

Slack machine tool and textile mill equipment foundry melts slowed pig iron shipments in New England during March. Other area shops also are on reduced work schedules, and the district foundry melt is estimated at not over 50 per cent of capacity. Operations at the cast iron pipe shop are somewhat higher than that, though.

At Buffalo, the merchant iron trade is limping along with most area foundries operating around 50 per cent of capacity.

Pig iron sellers are able to give prompt shipments, and most of the current buying is in small lots and on a hand-to-mouth basis. Iron inventories in most cases, though, are low.

The first pig iron cargo for the 1958 Great Lakes shipping season is being readied at Buffalo. It will move out just as soon as ice permits. The lake movement will get a much slower start this year than in recent years.

The U. S. Steel Corp. has blown out its No. 11 blast furnace at Gary, Ind., for relining. This leaves only 24 of the district's 43 stacks active.

Blast Furnace Output Off

Production of blast furnace products (pig iron, ferromanganese, and spiegeleisen) totaled 4,064,229 net tons in February, reports the American Iron & Steel Institute. Of the total, 4,016,276 tons were pig iron and 47,953 tons were ferroalloys.

Output in the first two months this year was 8,918,673 tons (8,801,545 tons of pig iron and 117,128 tons of ferroalloys). Comparative figures follow:

BLAST FURNACE PRODUCTION—FEBRUARY, 1958

(Net tons)

	February, 1958		February, 1957		Total Year To Date	
Districts	Pig Iron	Ferroalloys	Pig Iron	Ferroalloys	1958	1957
Eastern	941,681	22,854	1,337,450	32,111	2,209,234	2,878,951
Pittsburgh-Youngstown	1,258,659	22,541	2,339,999	19,355	2,767,884	4,936,905
Cleveland-Detroit	388,999	.....	778,817	.....	902,435	1,621,418
Chicago	864,396	.....	1,364,543	.....	1,832,696	2,846,072
Southern	316,376	2,558	456,772	10,507	717,267	982,862
Western	246,165	.....	318,552	.....	489,157	674,241
Totals	4,016,276	47,953	6,596,133	61,973	8,918,673	13,940,449

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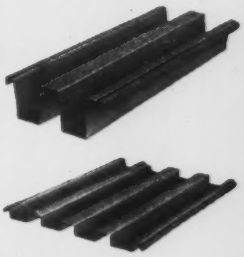

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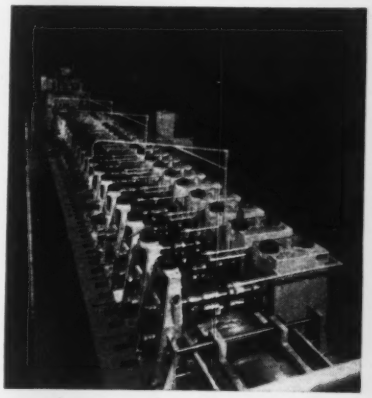

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Semifinished Steel . . .

Semifinished Prices, Page 127

The national ingot rate is bouncing around the 50.5 per cent of capacity mark, the lowest point since 1939, barring strike and holiday interruptions. Signs for an early upturn in production are not promising. Further cutbacks are being scheduled by some producers, largely because of high stocks of semifinished steel.

At Detroit, Great Lakes Steel Corp., a division of National Steel Corp., will shut down its Rouge facilities Apr. 4 for two or three weeks because of high stocks of semifinished. The company employs 10,000 in this mill. Some 4000 workmen have been off since early in the year. The scheduled shutdown will affect most of the 6000 still on the payroll.

Ford Motor's steel mill at Detroit is down for three weeks. The company is reported to have enough finished and semifinished steel on hand to build 200,000 cars.

A recent 3-day unauthorized strike at the Indiana Harbor (Ind.) Works of Youngstown Sheet & Tube Co. cost close to 10,000 tons of ingot steel. The plant resumed production Mar. 23.

Since November, about 300 employees of the Columbia-Geneva Steel Div., U. S. Steel Corp., in Pittsburg, Calif., have been recalled. The plant is on a two-furnace operating schedule in the open-hearth department until sometime in May, when a third furnace will be activated.

Wire . . .

Wire Prices, Pages 129 & 130

Wiremakers are anticipating a substantial increase in order volume as the spring construction season opens. So far, merchant products have not spurted to the extent that had been expected, and manufacturing wire needs continue limited.

A fair pickup in wire and wire fabric demand, possibly as much as 15 per cent, is noted at Detroit. This reflects more road building. The tonnage increase is small.

Competition from foreign wire products is increasing. A Buffalo area wiremaker says its sales have been hit by foreign competition. Increased imports on the West Coast

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are having an adverse affect on domestic sales in that area. Price competition there is severe.

Slack automotive demand is holding down wire bookings in New England. While demand from other industrial users is off, the automotive lag is most severely felt, affecting virtually all kinds of manufactures from screws to springs.

Consumers are holding their purchases of steel to the lower level of demand prevailing for their finished products. Prices on some products are easing under pressure of stiffer competition. Wire rope is one item reflecting this competition, though rope wire prices are generally firm.

Wire rod production is off at several points in New England, to about 50 per cent of capacity.

Tin Plate . . .

Tin Plate Prices, Page 129

Shipments of tin plate are running 80 to 90 per cent of year-ago volume, one Pittsburgh producer reports. Other makers agree that demand is firmer for this product than other steel items, but they are not operating at capacity.

Suppliers anticipate continued heavy shipments through the second quarter. But predictions for the third quarter are not being made; shipments in that period will depend upon the size of crops this summer.

Tin plate producers say canmakers shipped large tonnages before the recently announced price increase on cans became effective. Their stocks of tin plate are low.

About the only spirited activity in the steel market at Chicago is that provided by tin plate. Operation of the tin mills there is only a little below capacity.

Ship Fewer Steel Barrels

Shipments of steel shipping barrels and drums in December totaled 2,323,640 units, 8 per cent below shipments in November, and 16 per cent below shipments in December, 1956, reports the Bureau of the Census.

The total in 1957 was 34,748,342 units, vs. 37,990,574 in 1956.

The movement of shipping pails in December involved 4,442,810 units, 10 per cent below November shipments, and 18 per cent below the December, 1956, total.

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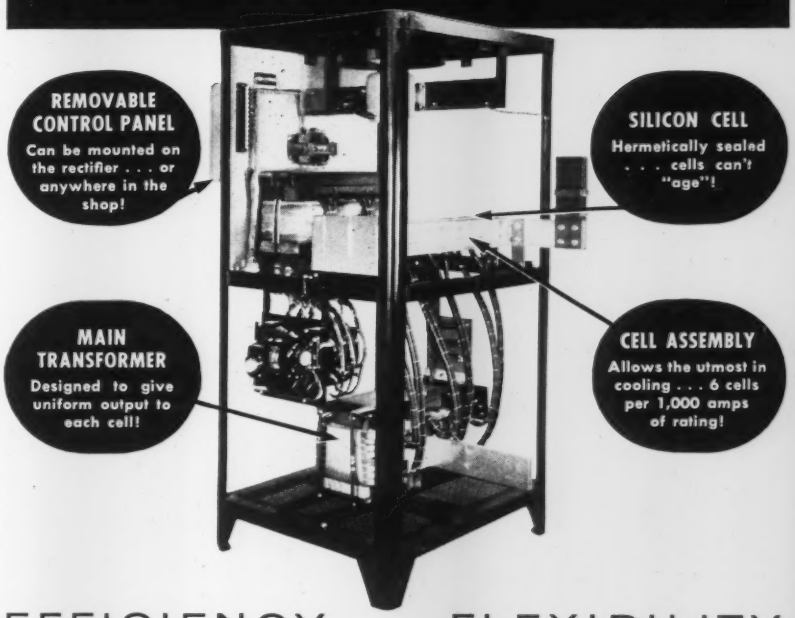
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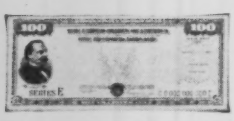

STEEL
The Metalworking Weekly

PUBLIC SERVICE ADVERTISING COUNCIL

Tubular Goods . . .

Tubular Goods Prices, Page 131

Scattered signs of a pickup in sales of buttweld pipe for plumbing and heating applications are noted. Cold weather in March is thought to have held back the seasonal surge in demand, and it is now believed April volume will show substantial gains.

Line pipe and oil country tubing sales are slow. Customers' stocks of oil country tubing are still thought to be too high to expect an early upturn in ordering. The decline in demand for that product, though, apparently has ended, and producers now think demand is leveling out, and should improve in late third quarter.

Foreign pipe (buttweld and continuous weld up to 4-in.) is being offered on the Atlantic seaboard at prices 15 per cent under those quoted on domestic pipe.

Several producers have reduced the leadtime for booking seamless, closing the 25th of each month for the following 30-day schedule. Buttweld pipe can be shipped in one week.

New England distributors are well stocked, including seamless.

Mechanical and pressure tubing demand is up slightly, delivery being available in three to four weeks.

Cast iron pipe sales agencies in the Pacific Northwest are enjoying an active buying season. Bids are in on 1000 tons at Everett and Tacoma, Wash., while smaller tonnages are up for action at other cities in the area.

Plates . . .

Plate Prices, Page 127

Tank fabricators report some improvement in oil storage requirements, but they note no change in demand from municipalities for water storage units. Industrial needs for water tanks continue to shrink.

Over-all, there is a slight betterment in this area of the plate market. Tank shops are drawing on stocks of light gage plates.

Plate requirements of structural fabricators are a shade better, and the shipyards are specifying fairly actively. Lack of line pipe work and railroad equipment tonnage continues pronounced. The Supreme Court is not expected to review the "Memphis Case" decision until fall, which means construction of pipe-

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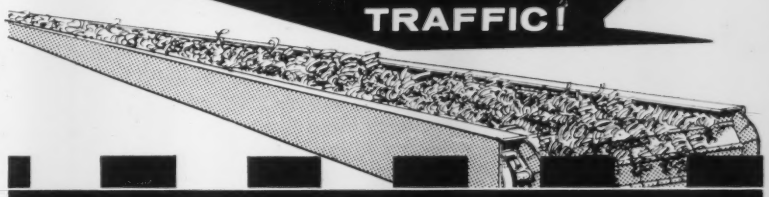
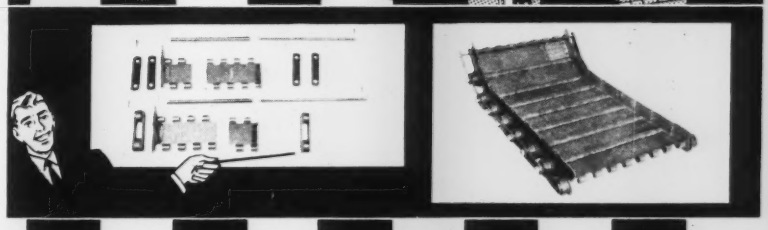
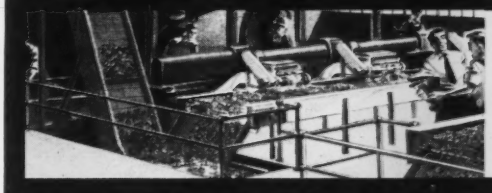




May-Fran Hinged-Steel Belting is assembled from mass-produced components to form a materials handling belting of almost any width, length or contour to meet individual specifications. Links are joined by means of steel rods . . . links, wings and side chain become integral unit.



Belting can be assembled in a wide range of lengths, widths and contours . . . to facilitate the handling of metal scrap, hot forgings, stampings, flash, wet or dry chips as well as other sharp or rough materials.

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MAY-FRAN HINGED-STEEL BELTING GIVES PRODUCTION SAVINGS THROUGH SCRAP HANDLING EFFICIENCY

Precision formed steel links are assembled in horizontal rows and joined by high-carbon steel tubes and connecting rods. These rods are fastened to side chains to support the belt links so they "float" freely, and side chain takes all tension. Wings remain positively engaged and in continuous overlap at all times, even over sprockets.

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lines requiring more than a half million tons of plates will continue suspended for months to come.

Activity is starting in construction with a slight pickup in demand for structurals. If this continues, it should carry over into plates, though a stumbling block is presented by the fact structural fabricators have not reduced their inventories of shapes and plates to the same degree that some other industries have, and, consequently, their new buying will continue restricted.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 127

Road building and other public construction are expected to provide a strong market for reinforcing steel in the months ahead. Cold weather delayed the seasonal surge in activity during March, but expectations are that April volume will make up for the sluggishness of recent weeks.

Demand for concrete bars mirrors the shortage of structural steel during most of 1957. Many contractors switched to bars for numerous structures that were originally planned for steel frame construction. In New England, some of these replacement bar tonnages now are being placed, notably for college and university buildings.

Rails, Car . . .

Track Material Prices, Page 130

February orders for freight cars totaled only 294, vs. 401 in January and 6065 in February, 1957, report the American Railway Car Institute and the Association of American Railroads.

The order backlog at the start of March was 43,750 cars, vs. 48,787 on Feb. 1 and 111,965 a year ago.

Deliveries of new freight cars numbered 5316 in February, down from the 7219 delivered in January, and the 8184 delivered in February, 1957.

Warehouse . . .

Warehouse Prices, Page 132

Except for a slight quickening in demand at several points, steel is moving through the warehouses into consumers' hands at pretty much the same rate as prevailed during February. March volume is not up to seasonal expectations, and the distributors now are looking to April to confirm their hopes of a spring pickup.

At Pittsburgh, sales in the last half of March topped those of the first half, but the district warehousemen doubt the betterment indicated a significant upswing. Cold weather has been a factor in holding down sales.

Eastern sellers say spring pickup has not yet set in. While March may top February business on a daily basis, volume is disappointing. Detroit area warehouses report demand holding up reasonably well, but say volume is maintained only through sharp selling. Price cutting appears to be increasing in the district.

On daily average, slight improvement in warehouse volume was noted during March in New England.

(For more on the warehouse market, see story on Page 75.)

Structural Shapes . . .

Structural Shape Prices, Page 127

Structural steel demand is slightly improved; indications point to a further rise over coming weeks. Reflecting the somewhat stronger market tone, fabricated steel prices are stiffening. There is still a lot of bidding, and competition is keen, but the wild price slashing of recent weeks appears to have faded.

Another significant development is the awarding of several jobs to eastern fabricators on their quotations submitted weeks ago. These jobs had been dropped from the fabricators' active lists.

Currently, the market is featured by government work—bridges, schools, and institutional buildings. Industrial work continues to lag. Fabricators' backlogs continue to shrink, but most shops are operating at fair levels. Medium and large fabricators can work in tonnage within three to five months; the small shops, though, are hard pressed to keep going, and they can do much better on deliveries.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, state highway bridges, Lycoming County, Pennsylvania, to the Pine Brook Iron Works Inc., Dunmore, Pa.; J. Richard Nissley Inc., Landisville, Pa., general contractor.

2000 tons, 1-story addition, office building, Liberty Mutual Insurance Co., Boston, to the American Bridge Div., U. S. Steel Corp., Pittsburgh; Turner Construction Co., Boston, general contractor.

2000 tons, Long Island Railroad grade separations, Freeport, Long Island, N. Y., through Hendrickson Bros., general contractor, to the Lehigh Structural Steel Co., Allentown, Pa.

1440 tons, state bridge work, FISH 58-24, Saratoga County, New York, through Arute Bros. Inc., general contractor, to the City Iron Works Inc.,

1000 tons, basic science building, Johns Hopkins University, Baltimore, to the Lehigh Structural Steel Co., Allentown, Pa.; Consolidated Engineering Co. Inc., Baltimore, is general contractor.

850 tons, boiler supports, powerplant, Ft. Everglades, Fla., through Combustion Engineering Inc., New York, to the Ingalls Iron Works Co., Birmingham.

840 tons, boiler supports, powerplant for the Carolina Power Co. through Combustion Engineering Inc., New York, to the American Bridge Div., U. S. Steel Corp., Pittsburgh.

800 tons, additional wing, St. Mary's Hospital, Huntington, W. Va., to Montague-Betts, Huntington; Frank Messer & Sons Inc., Cincinnati, general contractor.

780 tons, Home for the Aged, Uniondale, N. Y., through the Depot Construction Co., general contractor, to the Elizabeth Iron Works, Union, N. J.

675 tons, Skagit River bridge, Washington State, to the Bethlehem Pacific Coast Steel Corp., Seattle; Manson Construction & Engineering Co., Seattle, general contractor.

530 tons, maintenance shops, Camp Kilmer, N. J., (near New Brunswick), through the Gramercy Construction Corp., to the Elizabeth Iron Works, Union, N. J.

515 tons, building, Harpur College, Endicott, N. Y., through Avella Construction Co., general contractor, to the Bethlehem Contracting Co., Bethlehem, Pa.; still pending are 380 tons for a library, on which the Foster-Newman Construction Co. is general contractor.

500 tons, including reinforcing bars, Federal Building, Albuquerque, N. Mex., to Robberson Steel Co., Oklahoma City, Okla.; C. H. Leavell & Co., El Paso, Tex., general contractor.

500 tons, structurals and bars, courthouse and jail, Orlando, Fla., to the Kline Iron Works, Columbia, S. C. (structurals), and the Virginia Steel Co., Richmond, Va. (reinforcing); William A. Berbusse Jr. Inc., Palm Beach, Fla., general contractor.

300 tons plus, Swift Packing Co. plant, Portland, Oreg., to A. Young & Sons, Portland, Oreg.

285 tons, including H-piles and reinforcing bars, 4-span overpass, Johnson Road, Falmouth, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Reed & Reed, Woolwich, Maine, general contractor.

245 tons, including H-piles and reinforcing bars, 225-ft state bridge, Little Androscoggin River, Auburn, Maine, to the Bancroft & Martin Rolling Mills Co., South Portland, Maine; A. P. Wyman Inc., Waterville, Maine, general contractor.

185 tons, high school, West Lawn, Pa., to the Reading Metal Craft Co., Reading, Pa.; Potteiger Co. Inc., West Reading, Pa., general contractor.

180 tons, three-span I-beam stringer bridge, Wentworth, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Maine; D. E. Ambrose & Son, Meridith, N. H., general contractor.

150 tons, dormitory and dining hall, Wheaton College, Norton, Mass., to the John E. Cox Co., Fall River, Mass. (structurals), and the Plantations Steel Co., Providence, R. I. (reinforcing); J. L. Marshall & Son Inc., Pawtucket, R. I., is general contractor.

100 tons, also reinforcing steel, Mt. McKinley Park, Alaska, bridges, to an unstated fabricator; general contract to H. Flecksing & Co., Missoula, Mont.

STRUCTURAL STEEL PENDING

1380 tons, work section No. 4, St. Lawrence Seaway, Lewiston, N.Y.; bids Apr. 24. Power Authority, State of New York.

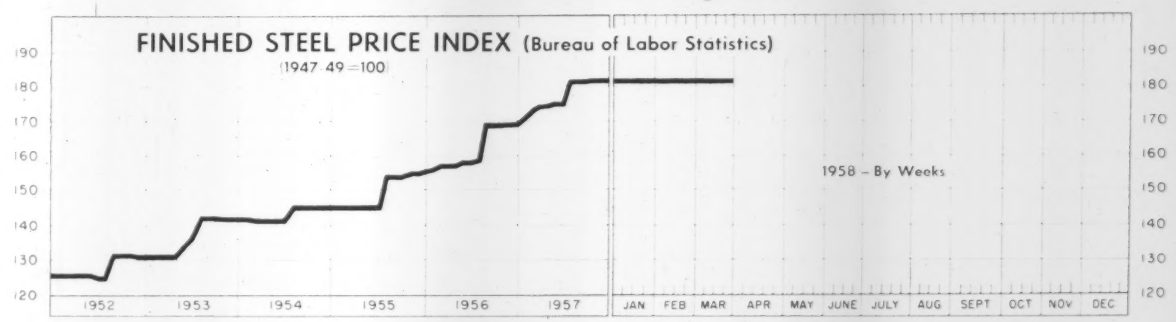
1000 tons or more, office building and post-office, Seattle; plans in preparation, bids to be taken soon.

800 tons, Seattle National Bank of Commerce addition and garage; Cawdrey & Vemo, Seattle, low at $2,042,598.

500 tons, including miscellaneous iron works, housing project NJ 2-15, Newark, N. J., Minkov Steel & Iron Works is low on direct bids, Contract No. 2.

(Please turn to Page 144)

Price Indexes and Composites



Mar. 25, 1958	Week Ago	Month Ago	Feb. Avg.	Year Ago
181.6	181.6	181.7	181.8	174.0

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Mar. 25

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.135
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.270
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.492
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.095
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Mar. 26 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	227.41	181.31
Index in cents per lb	6.479	6.479	6.479	6.161	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$139.51	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	64.70	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	64.23	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	65.77	55.77
Steelmaking Scrap, GT	34.50	36.33	37.17	47.67	44.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Mar. 26 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Hars, H.R., deld., Philadelphia	5.725	5.725	5.725	5.365	4.502
Bars, C. F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.31	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.975-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.225-5.475
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.49	6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 7/32-5/8" Pitts.	6.15	6.15	6.15	5.80	4.425

PIG IRON, Gross Ton	Mar. 26 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$65.50	$55.50
Basic, Valley	66.00	66.00	66.00	64.50	54.50
Basic, deld., Phila.	70.41	70.41	70.41	68.38	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	65.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	65.00	55.00
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	68.88	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	65.00	55.00
Malleable, Chicago	66.50	66.50	66.50	65.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	255.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$34.50	$36.50	$35.50	$46.50	$44.00
No. 1 Heavy Melt, E. Pa.	38.50	38.50	38.50	52.00	46.00
No. 1 Heavy Melt, Chicago	30.50	34.00	52.00	44.50	42.50
No. 1 Heavy Melt, Valley	34.50	37.50	37.50	44.50	44.25
No. 1 Heavy Melt, Cleve.	31.50	33.50	33.50	41.50	44.25
No. 1 Heavy Melt, Buffalo	28.50	28.50	28.50	48.50	47.00
Rails, Rerolling, Chicago	54.50	54.50	54.50	59.50	56.00
No. 1 Cast, Chicago	41.50	41.50	41.50	41.50	43.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.00	17.00

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Artist's drawing of an intercontinental strategicmissile, courtesy Rocketdyne Division, North American Aviation, Inc.,

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SEAMLESS AND WELDED AND DRAWN STAINLESS STEEL TUBING
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(.008" to 1.000" O.D.—
.003" to .083" Wall)

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JB

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"Metals for Precision and Performance"

Steel Prices

Mill prices as reported to STEEL, Mar. 26, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 128; to footnotes, page 130.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 ....$77.00
Farrell,Pa. S3 ....77.00
Lowellville,O. S3 ....77.00
Midland,Pa. C18 ....77.00
Munhall,Pa. U5 ....77.00
Sharon,Pa. S3 ....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 ....77.50
Clairton,Pa. U5 ....77.50
Ensley,Ala. T2 ....77.50
Fairfield,Ala. T2 ....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 ....77.50
Johnstown,Pa. B3 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 ....77.50
Owensboro,Ky. G8 ....77.50
S.Chicago,Ill. R2, U5 ..77.50
S.Duquesne,Pa. U5 ..77.50
Sterling,Ill. N15 ....77.50
Youngstown R2 ....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 ....96.00
Canton,O. R2 ....98.50
Clairton,Pa. U5 ....96.00
Conshohocken,Pa. A3 ..101.00
Ensley,Ala. T2 ....96.00
Fairfield,Ala. T2 ....96.00
Fontana,Calif. K1 ...105.50
Gary,Ind. U5 ....96.00
Geneva,Utah C11 ....96.00
Houston S5 ....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 ....105.50
Midland,Pa. C18 ....96.00
Munhall,Pa. U5 ....96.00
Owensboro,Ky. G8 ....96.00
Seattle B3 ....109.50
Sharon,Pa. S3 ....96.00
S.Chicago R2, U5, W14 ..96.00
S.Duquesne,Pa. U5 ...96.00
S.SanFrancisco B3 ..105.50
Warren,O. C17 ....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$114.00
Bridgeport,Conn. C32 .114.00
Buffalo R2 ....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 .121.00
Detroit S41 ....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 ....114.00
Fontana,Calif. K1 ...135.00
Gary,Ind. U5 ....114.00
Houston S5 ....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2.114.00
LosAngeles B3 ....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 ....114.00
Midland,Pa. C18 ....114.00
Munhall,Pa. U5 ....114.00
Owensboro,Ky. G8 ....114.00
Sharon,Pa. S3 ....114.00
S.Chicago R2,U5,W14 .114.00
S.Duquesne,Pa. U5 ..114.00
Struthers,O. Y1 ....114.00
Warren,O. C17 ....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$117.50
Canton,O. R2 ....120.00
Cleveland R2 ....117.50
Gary,Ind. U5 ....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ..117.50
Warren,O. C17 ....117.50

SKELP
Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 ....4.875
Pittsburgh J5 ....5.075
Warren,O. R2 ....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 ....6.15
Alton,Ill. L1 ....6.35
Buffalo W12 ....6.15
Cleveland A7 ....6.15
Donora,Pa. A7 ....6.15
Fairfield,Ala. T2 ....6.15
Houston S5 ....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 ....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 ....6.25
LosAngeles B3 ....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 ....6.15
N.Tonawanda,N.Y. B11 6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 ....6.25
S.Chicago,Ill. R2 ....6.15
SparrowsPoint,Md. B2..6.25
Sterling,Ill.(1) N15 ....6.15
Sterling,Ill. N15 ....6.25
Struthers,O. Y1 ....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2..5.275
Atlanta A11 ....5.475
Aliquippa,Pa. J5 ....5.275
Bessemer,Ala. T2 ....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 ....5.275
Clairton,Pa. U5 ....5.275
Fairfield,Ala. T2 ....5.275
Fontana,Calif. K1 ....6.075
Gary,Ind. U5 ....5.275
Geneva,Utah C11 ....5.275
Houston S5 ....5.375
Ind.Harbor,Ind. I-2 ..5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 ....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 ....5.975
Minnequa,Colo. C10 ...5.575
Munhall,Pa. U5 ....5.275
Niles,Calif. P1 ....5.925
Phoenixville,Pa. P4 ...5.325
Portland,Oreg. O4 ....6.025
Seattle B3 ....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ...5.975
Sterling,Ill. N15 ....5.275
Torrance,Calif. C11 ...5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 ....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.275
Lackawanna,N.Y. B2..5.325
Munhall,Pa. U5 ....5.275
Phoenixville,Pa. P4 ...5.325
S.Chicago,Ill. U5 ....5.275
Weirton,W.Va. W6 ....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 ....6.55
S.Chicago,Ill. U5 ....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ....7.75
Bessemer,Ala. T2 ....7.75
Bethlehem,Pa. B2 ....7.80
Clairton,Pa. U5 ....7.75
Fairfield,Ala. T2 ....7.75
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 ....7.75
Geneva,Utah C11 ....7.75
Houston S5 ....7.85
Ind.Harbor,Ind. I-2, Y1.7.75
Johnstown,Pa. B2 ....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 ....8.45
Munhall,Pa. U5 ....7.75
Seattle B3 ....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ...8.40

Struthers,O. Y1 ....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 ....7.75
S.Chicago,Ill. U5 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 ....5.275
S.Chicago,Ill. U5 ....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 ....6.225
S.Chicago,Ill. U5 ....6.225
Weirton,W.Va. W6 ....6.225

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.10
Aliquippa,Pa. J5 ....5.10
Ashland,Ky.(15) A10 ...5.10
Atlanta A11 ....5.30
Bessemer,Ala. T2 ....5.10
Clairton,Pa. U5 ....5.10
Claymont,Del. C22 ....5.10
Cleveland J5, R2 ....5.20
Coatesville,Pa. L7 ....5.10
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 ....5.20
Fairfield,Ala. T2 ....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 ....5.10
Geneva,Utah C11 ....5.10
GraniteCity,Ill. G4 ....5.30
Harrisburg,Pa. P4 ....5.10
Houston S5 ....5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa. B2 ....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 ....5.20
Mansfield,O. E6 ....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 ....5.10
Newport,Ky. A2 ....5.10
Pittsburgh J5 ....5.10
Riverdale,Ill. A1 ....5.10
Seattle B3 ....6.00
Sharon,Pa. S3 ....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 ....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 ....5.10
Youngstown U5, Y1 ....5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....6.75
Fontana,Calif. K1 ....7.55
Geneva,Utah C11 ....6.75
Houston S5 ....6.85
Johnstown,Pa. B2 ....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 ....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.625
Bessemer,Ala. T2 ....7.625
Clairton,Pa. U5 ....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 ....7.625
Coatesville,Pa. L7 ....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 ....7.625
Ecorse,Mich. G5 ....7.725
Fairfield,Ala. T2 ....7.625
Farrell,Pa. S3 ....7.625
Fontana,Calif.(30) K1 ..8.425
Gary,Ind. U5 ....7.625
Geneva,Utah C11 ....7.625
Houston S5 ....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 ....7.625
Munhall,Pa. U5 ....7.625
Pittsburgh J5 ....7.625
Seattle B3 ....8.525
Sharon,Pa. S3 ....7.625
S.Chicago,Ill. U5, W14 ..7.625
SparrowsPoint,Md. B2..7.625
Warren,O. R2 ....7.625
Youngstown U5 ....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 ....7.20
Claymont,Del. C22 ....7.20
Coatesville,Pa. L7 ....7.20
Economy,Pa. B14 ....7.20
Fontana,Calif. K1 ....8.00
Gary,Ind. U5 ....7.20
Houston S5 ....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 ....7.20
Lowellville,O. S3 ....7.20
Munhall,Pa. U5 ....7.20
Newport,Ky. A2 ....7.20
Pittsburgh J5 ....7.20
Seattle B3 ....8.10
Sharon,Pa. S3 ....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 ....7.20

FLOOR PLATES
Cleveland J5 ....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ...6.175
Munhall,Pa. U5 ....6.175
S.Chicago,Ill. U5 ....6.175

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.35
Ashland l.c.l.(15) A10..5.85
Cleveland c.l. R2 ....5.85
Warren,O. c.l. R2 ....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ...5.425
Aliquippa,Pa.(9) J5 ..5.425
Alton,Ill. L1 ....5.625
Atlanta(9) A11 ....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Buffalo(9) R2 ....5.425
Clairton,Pa.(9) U5 ...5.425
Cleveland(9) R2 ....5.425
Ecorse,Mich.(9) G5 ...5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ...5.425
Fairless,Pa.(9) U5 ...5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 ....5.425
Houston(9) S5 ....5.675
Ind.Harbor(9) I-2, Y1..5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 ....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 ....6.125
Midland,Pa.(23) C18 ...5.725
Milton,Pa. M18 ....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 ....6.125
N.T'wanda,N.Y.(23)B11 5.775
Owensboro,Ky.(9) G8 ..5.425
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 ....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 ....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ...5.525
Struthers,O.(9) Y1 ...5.425
Tonawanda,N.Y. B12 ...5.425
Torrance,Calif.(9) C11 ..6.125
Youngstown(9) R2, U5..5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 ....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. C32 ..6.55
Buffalo R2 ....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 ....6.475
Detroit S41 ....6.475
Economy,Pa. B14 ....6.475
Ecorse,Mich. G5 ....6.575
Fairless,Pa. U5 ....6.625
Farrell,Pa. S3 ....6.475
Fontana,Calif. K1 ....7.575
Gary,Ind. U5 ....6.475
Houston S5 ....6.725
Ind.Harbor,Ind. I-2, Y1..6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 ....6.475
LosAngeles B3 ....7.525
Massillon,O. R2 ....6.475
Midland,Pa. C18 ....6.475
Owensboro,Ky. G8 ....6.475
Pittsburgh J5 ....6.475
Sharon,Pa. S3 ....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 ....6.475
Warren,O. C17 ....6.475
Youngstown U5 ....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....7.925
Bessemer,Ala. T2 ....7.925
Bethlehem,Pa. B2 ....7.925
Clairton,Pa. U5 ....7.925
Cleveland R2 ....7.925
Ecorse,Mich. G5 ....8.025
Fairfield,Ala. T2 ....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 ....7.925
Houston S5 ....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 ....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 ....8.625
Pittsburgh J5 ....7.925
Seattle B3 ....8.675
S.Chicago,Ill. U5, W14..7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ...8.675
Struthers,O. Y1 ....7.925
Youngstown U5 ....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 ....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 ....5.525
Sterling,Ill.(1) N15 ...5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....5.425
Atlanta A11 ....5.625
Joliet,Ill. P22 ....5.425
Niles,Calif. P1 ....6.125
Pittsburgh J5 ....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 ....6.275
Seattle B3 ....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 ....6.55
Youngstown U5 ....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.925
BeaverFalls,Pa. M12..9.925
Camden,N.J. P13 ....10.10
Chicago W18 ....9.925
Cleveland C20 ....9.925*
Elyria,O. W8 ....9.925
LosAngeles P2, S30 ..11.40*
Monaca,Pa. S17 ....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 ....9.925

*Grade A; add 0.50c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 ....7.90
Buffalo B5 ....7.35
Camden,N.J. P13 ....7.75
Carnegie,Pa. C12 ....7.30
Chicago W18 ....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 ....7.50
Detroit S41 ....7.30
Donora,Pa. A7 ....7.30
Elyria,O. W8 ....7.30
FranklinPark,Ill. N5 ...7.30
Gary,Ind. R2 ....7.30
GreenBay,Wis. F7 ....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 ....7.80
Harvey,Ill. B5 ....7.30
LosAngeles(49) S30 ....8.75
LosAngeles P2, R2 ....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 ....7.30
Monaca,Pa. S17 ....7.30
Newark,N.J. W18 ....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 ....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 ....7.75
Struthers,O. Y1 ....7.30
Warren,O. C17 ....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 ....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 ....8.775
Camden,N.J. P13 ....8.95
Canton,O. T7 ....8.775
Carnegie,Pa. C12 ....8.775
Chicago W18 ....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 ....8.975
Detroit S41 ....8.775
Donora,Pa. A7 ....8.775
Elyria,O. W8 ....8.775
FranklinPark,Ill. N5 ...8.775
Gary,Ind. R2 ....8.775
GreenBay,Wis. F7 ....8.775
Hammond,Ind. J5, L2 ..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 ....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30 ...10.75
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ....8.775
Midland,Pa. C18 ....8.775
Monaca,Pa. S17 ....8.775
Newark,N.J. W18 ....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 ....8.95
Struthers,O. Y1 ....8.775
Warren,O. C17 ....8.775
Waukegan,Ill. A7 ....8.775
Willimantic,Conn. J5 ...9.075
Worcester,Mass. A7 ....9.075
Youngstown F3, Y1 ....8.775

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.425
Atlanta A11 .....5.425
Birmingham C15 ....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T15.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ...5.675
Kokomo,Ind. C16 ....5.525
Lackawanna,N.Y. B2..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 .5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ..6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2, U8 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Houston S5 .....7.35
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 ....7.10
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts.(4)(44) I-2 5.425
ChicagoHts.(4) C2 ...5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O. (3) P11 ...5.325
Tonawanda(3) B12 ..5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill.(8) G4 .5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 ....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 .4.925
Steubenville,O. W10 ..4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.(19) Ga. & Lighter

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 ..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ...10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	....
Ind.Harbor I-2	..6.95	7.20
Irvin,Pa. U5	....6.95	7.20
Kokomo,Ind. C16	7.05	....
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	....
Pittsburgh J5	....6.95	....
SparrowsPt. B2	..6.95	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.20

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 ..6.60†
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60†
Dover,O. E6 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60†
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ....6.60†
Irvin,Pa. U5 .....6.60†
Kokomo,Ind. C16 ....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11....7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ..6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.425
Niles,O. (28) R2 .....7.425
Youngstown J5 .....7.275
Weirton,W.Va. W6 ..7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.625
Cleveland R2 .....6.625
Fairfield,Ala. T2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 ....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 ....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, R2, S3 ..7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W.Co.
N20 Neville Ferroalloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div. Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	4.925
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.Chicago W14	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18*	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2, S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.60
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.10	21.95	26.30
Buffalo W12	...	...	18.10	....	....
Fostoria,O. S1	...	...	18.30	22.15	....
FranklinPark,Ill. T6	...	...	18.45	22.30	26.65
Harrison,N.J. C18	...	...	18.10	21.95	26.30
New York W3	...	...	18.10	21.95	26.30
Palmer,Mass. W12	...	...	18.10	....	....
Trenton,N.J. R5	...	...	18.10	21.95	26.30
Worcester,Mass. A7, T6	...	...	18.10	21.95	26.30
Youngstown J5	...	...	18.45	22.30	26.65

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10	....	11.35†	12.05	13.15	14.20
					Stator
Vandergrift,Pa. U5	....	....	....	....	7.85

H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	15.25††
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower. ††Coils only.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.65
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
New Haven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7	9.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
MuncieInd. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester A7, J4, T6	9.30

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE (A)

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	.173
Aliquippa,Pa. J5	.173
Atlanta A11	.175
Bartonville,Ill. K4	.175
Chicago W13	.173
Cleveland A9	.173
Crawfordsville,Ind. M8	.175
Donora,Pa. A7	.173
Duluth A7	.173
Fairfield,Ala. T2	.173
Houston S5	.178
Jacksonville,Fla.(20) M8	.184
Johnstown,Pa. B2	.173
Joliet,Ill. A7	.173
KansasCity,Mo. S5	.178
Kokomo,Ind. C16	.175
Minnequa,Colo. C10	.178
Monessen,Pa. P7	.173
Pittsburg,Calif. C11	.192
Rankin,Pa. A7	.173
S.Chicago,Ill. R2	.173
SparrowsPt.,Md. B2	.175
Sterling,Ill.(7) N15	.175
Worcester,Mass. A7	.179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	.175
Aliquippa,Pa. J5	.175
Atlanta A11	.177
Bartonville,Ill. K4	.177
Crawfordsville,Ind. M8	.177
Donora,Pa. A7	.175
Duluth A7	.175
Fairfield,Ala. T2	.175
Houston S5	.180
Jacksonville,Fla.(20) M8	186
Johnstown,Pa. B2	.175
Joliet,Ill. A7	.175
KansasCity,Mo. S5	.180
Kokomo,Ind. C16	.177
Minnequa,Colo. C10	.180
Pittsburg,Calif. C11	.194
Rankin,Pa. A7	.175
S.Chicago,Ill. R2	.175
SparrowsPt.,Md. B2	.177
Sterling,Ill.(7) N15	.175
Worcester,Mass. A7	.181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	11.16
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.212
Atlanta A11	.214
Bartonville,Ill. K4	.214
Crawfordsville,Ind. M8	.214
Donora,Pa. A7	.212
Duluth A7	.212
Fairfield,Ala. T2	.212
Houston S5	.217
Jacksonville,Fla. M8	.219
Joliet,Ill. A7	.212
KansasCity,Mo. S5	.217
Kokomo,Ind. C16	.214
Minnequa,Colo. C10	.217
Pittsburg,Calif. C11	.236
S.SanFrancisco C10	.236
SparrowsPt.,Md. B2	.214
Sterling,Ill.(7) N15	.214

FENCE POSTS

Birmingham C15	.172
ChicagoHts., Ill. C2, I-2	.172
Duluth A7	.172
Franklin,Pa. F5	.172
Huntington,W.Va. C15	.172
Johnstown,Pa. B2	.172
Marion,O. P11	.172
Minnequa,Colo. C10	.177
Sterling,Ill.(1) N15	.172
Tonawanda,N.Y. B12	.174

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.193**
Aliquippa,Pa. J5	.190§
Atlanta A11	.198*
Bartonville,Ill. K4	.198
Crawfordsville,Ind. M8	.198
Donora,Pa. A7	.193†
Duluth A7	.193†
Fairfield,Ala. T2	.193†
Houston S5	.198**
Jacksonville,Fla. M8	.203
Johnstown,Pa. B2	.196§
Joliet,Ill. A7	.193†
KansasCity,Mo. S5	.198**
Kokomo,Ind. C16	.195†
Minnequa,Colo. C10	.198**
Monessen,Pa. P7	.196§
Pittsburg,Calif. C11	.213†
Rankin,Pa. A7	.193†
S.Chicago,Ill. R2	.193**
S.SanFrancisco C10	.213**
SparrowsPoint,Md. B2	.198§
Sterling,Ill.(7) N15	.198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	.187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	.192*
Bartonville,Ill. K4	.192
Crawfordsville,Ind. M8	.192
Donora,Pa. A7	.187†
Duluth A7	.187†
Fairfield,Ala. T2	.187†
Houston S5	.192**
Jacksonville,Fla. M8	.197
Johnstown,Pa.(43) B2	.190§
Joliet,Ill. A7	.187†
KansasCity,Mo. S5	.192**
Kokomo,Ind. C16	.189†
Minnequa,Colo. C10	.192**
Pittsburg,Calif. C11	.210†
Rankin,Pa. A7	.187†
S.Chicago,Ill. R2	.187**
Sterling,Ill.(7) N15	.192††

	An'ld Stone	Galv. Stone
WIRE (16 gage)		
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	.17.15	18.95
Bartonville K4	.17.25	19.05
Cleveland A7	.17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	.17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	.17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05††
Waukegan A7	.17.15	18.70†
Worcester A7	.17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	8.65 9.20†
Cleveland A7	8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	8.65 9.20†
Duluth A7	8.65 9.20†
Fairfield T2	8.65 9.20†
Houston(48) S5	8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	8.65 9.20†
Kans.City(48) S5	8.90 9.45**
Kokomo C16	8.75 9.30†
LosAngeles B3	9.60 10.275§
Minnequa C10	8.90 9.45**
Monessen P7(48)	8.65 9.325§
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	9.60 10.15†
Rankin,Pa. A7	8.65 9.20†
S.Chicago R2	8.65 9.20**
S.SanFran. C10	9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	8.90 9.575††
Sterling(1) (48)	8.80 9.475††
Struthers,O. Y1	8.65 9.30†
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter ...	49.0
Longer than 6 in. ..	39.0
⅝ in. thru 1 in.:	
6 in. and shorter ..	39.0
Longer than 6 in. ..	35.0
1⅛ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter..	49.0

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter..	29.0
Longer than 6 in..	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter..	49.0
Longer than 6 in...	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter ..	49.0
Larger than ½ in. or longer than 6 in...	39.0

Blank Bolts 39.0

Step, Elevator, Tire Bolts 49.0

Stove Bolts, Slotted:

⅛ to ¼ in. incl., 2 in. and shorter.	55.0
⅛ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes	55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

⅜ in. and smaller..	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger..	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

⅜ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, All Types, Hot Galvanized:

⅜ in. and smaller..	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller..	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger..	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller..	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger..	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller..	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller..	8.0
¾, ⅞, and 1 in. diam.	+ 6.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller..	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller..	+ 13.0
¾, ⅞, and 1 in. diam.	+ 32.0

Flat Head Capscrews:

¾ in. and smaller..	+ 76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter..	Net
Longer than 6 in...	+ 23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

$\frac{7}{16}$ in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2½	12	46.99	55.06	41.81
2¾	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	...(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+8	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	95.25	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.00	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	42.00
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets—Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	39.75
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.50	49.50	54.50	58.25
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.10	38.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....	....	4.285
18.25	4.25	1	4.75	....	....	2.500
18	4	2	9	....	....	2.870
18	4	2	....	....	....	1.960
18	4	1	....	....	....	1.795
9	3.5	..	....	....	....	1.395
13.5	4	3	....	....	....	2.060
13.75	3.75	2	5	....	....	2.440
6.4	4.5	1.9	....	5	....	1.300
6	4	3	....	6	....	1.545
1.5	4	1	....	8.5	....	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	70.90	....	71.40	71.90

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.50	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.50
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%.)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P.)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.35% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]	Structural Shapes	Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.78	....	8.76	9.06	11.34 #	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90 #	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90 #	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.10	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.10	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	10.20	52.33	8.33	8.69	10.80 #	14.74	9.01	8.79	10.11
Dallas	8.85	10.15	....	....	9.00	8.95	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.45	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.10	8.40	8.45	54.32	7.25	7.20	11.10	13.50	7.25	7.70	8.95
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.50	10.75	11.65	57.60	8.55	8.55	12.00	....	8.60	8.55	9.95
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96 #	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.23	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76 #	15.09	9.35	9.43	10.71
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.00	8.90	9.92	52.69	8.69	8.65	11.51 #	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.45	52.00	8.33	8.60	10.80 #	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.46	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.71	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [8]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa. Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River.	9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	30.30-45.70†
Bronze, 5000-lb lots	45.70-49.80†
Copper: Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	47.80-52.60†
Phosphor-Copper, 5000-lb lots	57.80
Copper (atomized) 5000-lb lots	38.30-46.80‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡

Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal:	
1000 lb and over..	3.15
Less than 1000 lb ..	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305 ..	$5.53	$5.33	$5.33	$5.73
Bar Size Angles	5.73	5.58	5.58	5.99
Structural Angles	5.73	5.58	5.58	5.99
I-Beams	5.88	5.72	5.72	6.02
Channels	5.88	5.72	5.72	6.02
Plates (basic bessemer)	6.79	6.62	6.62	6.94
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.23	6.07	6.07	6.43
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.02	8.02	7.92	8.20

†Per 82 lb, net, reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	27.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$11.80-$12.20*
Domestic, concentrates f.o.b. milling points	20.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $135 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$50.00
48% 2.8:1	48.00
48% no ratio	39.00

South African Transvaal

48% no ratio	$37.00
44% no ratio	27.00

Turkish

48% 3:1	$55.00

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens,	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.	

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton. Palmerton, Neville Island, Pa., 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton: $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.05% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38.43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.
Cr 67.71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025 max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, SM x D, 21.25c, per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅜" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c, per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c, for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contact, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALICIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags, 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets 15.3c; bags 16.3c. 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c; (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.15 per lb of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4.25 per lb of contained Cb; less ton lots, $4.30. Delivered.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $3.70 per lb of contained Cb plus Ta, delivered; less ton lot $3.75.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

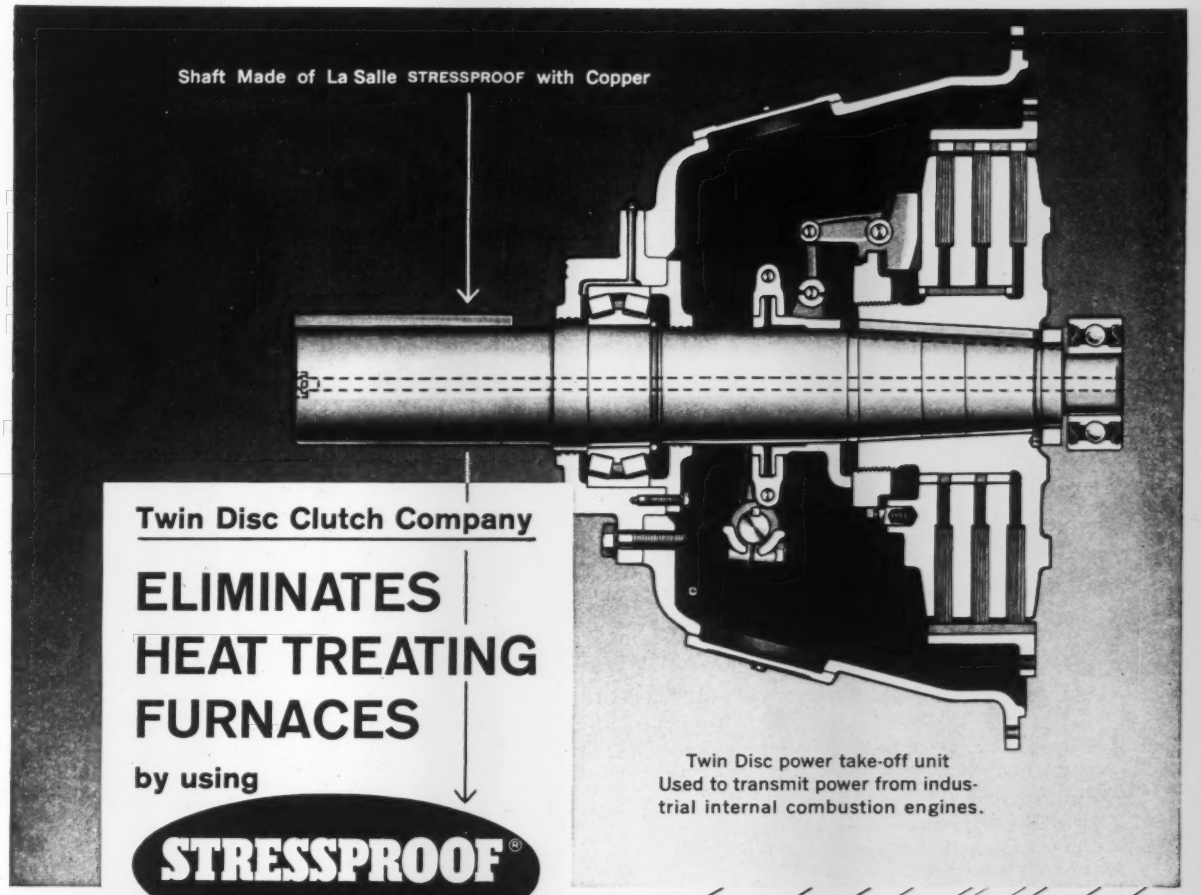
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unistage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo., in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.



Twin Disc power take-off unit
Used to transmit power from industrial internal combustion engines.

Twin Disc Clutch Company

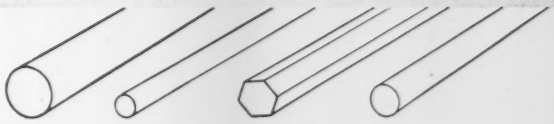
ELIMINATES HEAT TREATING FURNACES

by using

STRESSPROOF®

with copper

STEEL BARS



In Racine, Wisconsin, Twin Disc Clutch Co. saved money on a plant addition by eliminating heat treating furnaces . . . and they continue to save on part costs by using a material which needs no heat treatment . . . STRESSPROOF.

On the strength of over 15 years' experience with STRESSPROOF, Twin Disc knew they could cut their costs by purchasing this material which has the necessary properties in the bar.

They produce about 150 different models of power take-off shafts . . . see cross-section drawing. These shafts must possess great toughness and have the strength to take heavy loads. They must resist wear at the journals. Because one end of each shaft must be machined to individual customer specifications, machinability is important. Warpage after machining cannot be tolerated.

STRESSPROOF with copper fills these requirements on all counts because it has these four qualities in the bar: (1) Strength without heat treating. (2) Machinability (copper further improves machinability). (3) Excellent resistance to wear. (4) Minimum warpage.

By using STRESSPROOF, Twin Disc eliminates the cost of heat treating, cleaning and straightening. Working conditions are better . . . the plant is cleaner and cooler, and floor space requirements are less. Time and money consuming production steps are eliminated.

Twin Disc gets better parts at lower cost, and perhaps you can profit by their experience. Unless you have investigated STRESSPROOF recently, you may be overlooking worthwhile savings, especially since copper has now been added to improve machinability.

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La Salle STEEL COMPANY
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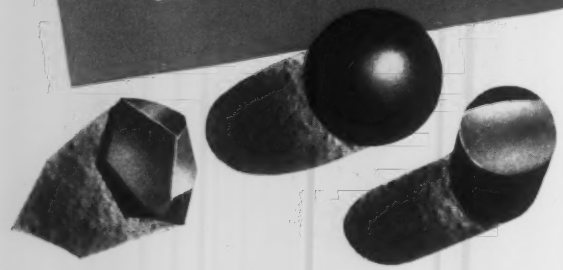

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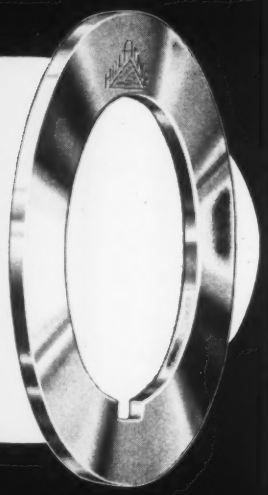

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STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
Mar. 19 1958 $34.50
Week Ago $36.33
Month Ago $37.17
Year Ago $47.67
Feb. Avg. $37.33

Scrap Price Decline Extended

Outlook for steel operations and sluggish demand combine to force market lower. STEEL's composite on the prime grade drops to $34.50, off $1.83 in week

Scrap Prices, Page 138

Philadelphia—Domestic demand for steel scrap is slow, but there is enough foreign demand to sustain prices on the major grades. The market undertone, though, is easier. Domestic buying shows no signs of early improvement, and the indications are that export inquiry in the second quarter will be off appreciably. A vessel scheduled for loading here is not due to arrive until Apr. 9.

The government is continuing its open-end policy on scrap exports, which was in effect in the first quarter. No shortages are anticipated, but Washington will continue to keep supply and demand under close watch, particularly with respect to the top grades.

Domestic demand for cast iron scrap is stronger than that for steel scrap.

Chicago — The scrap market sagged $3 to $4 a ton last week. Influences: Virtually no buying and a national steelmaking rate that set a new low for the year. Even more depressing is the lack of any prospect of the ingot trend reversing itself in the foreseeable future.

Inventories of scrap at mills are sizable and buying is at a standstill even though prices are favorable. Market determination is based on offers to mills rather than actual sales or prices which mills are willing to pay. Prices on the cast grades are firm.

Pittsburgh—A local mill purchased a small amount (under 1000 tons) of No. 1 heavy melting scrap at $35, and minor tonnages of No. 2 bundles at $27. The purchases show a weakening trend has developed. Both prices are $2 under previous quotations.

Brokers attribute the easiness to lower prices in neighboring areas and pessimism regarding second quarter steel operations.

Cleveland—Except for broker purchases of factory bundles on the automobile lists, trading is at a standstill here and in the Valley. Quoted prices are off $2 to $4 a ton, but they are nominal in the absence of mill buying. The automotive lists went at prices $3 to $4 under those of a month ago, No. 1 factory bundles commanding $33 - $34. About 9000 tons were involved in two auto lists in this area.

Detroit—The scrap market is easier as brokers and dealers eye high-priced inventories which they can't move at a profit. The latest reported bundle sale at Pittsburgh went at $28, delivered. Freight was $9.80.

Auto lists are closing and indicate a further reduction in prices. Chrysler is offering 278 cars of No. 1 grades, 54 fewer than last month. Some 80 carloads are originating in Chrysler's Ohio plants.

Detroit brokers and dealers feel that unless some of the larger scrap firms step in to maintain prices, the next lists will find the No. 1 grades down around $20.

Cincinnati—A weaker tone has developed in this market. Area mill buying in April is expected to be on the low tonnage side, and it's possible another $2 a ton may be whittled from the prices on the leading steelmaking grades. No. 2 bundles have eased $1 a ton to $23-$24, brokers' buying price. Buying support from outdistrict consumers has faded.

Buffalo—Firmness in the cast iron grades features the scrap market in this area. Cupola cast is up another $1 a ton to $43-$44. So is No. 1 machinery cast to $48-$49.

Demand for the steel grades continues dull. No new business is noted. Some dealers anticipate continued slack demand through April. The leading mill here has substantial inventories.

Youngstown — The local scrap trade is marking time. No new sales are reported and consumer interest is nil. Large users have indicated they expect lower prices when they do resume purchasing.

St. Louis—Scrap is weaker, largely because of the failure of offerings by the Frisco, Missouri Pacific, and the Louisville & Nashville railroads

(*Please turn to Page* 143)

EUREKA FIRE BRICK WORKS
Works: Mt. Braddock, Fayette Co., Pa.
Dunbar, Pa. . . . 4213
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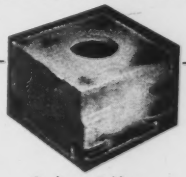

Sales Office
132 S. Whitfield St.
PITTSBURGH 6, PA. EM: 2-0614

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Mar. 26, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Mar. 26	$34.50
Mar. 19	36.33
Feb. Avg.	37.33
Mar. 1957	49.63
Mar. 1953	44.05

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 dealer bundles	*34.00-35.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*34.00-35.00*
No. 1 factory bundles	*38.00-39.00*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals:	
2 ft and under	*40.00-41.00*
3 ft lengths	*39.00-40.00*
Heavy turnings	*32.00-33.00*
Punchings & plate scrap	*39.00-40.00*
Electric furnace bundles	*39.00-40.00*

Cast Iron Grades

No. 1 cupola	40.00-41.00
Stove plate	40.00-41.00
Unstripped motor blocks	26.00-27.00
Clean auto cast	42.00-43.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	40.00-41.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Angles, splice bars	49.00-50.00
Rails, rerolling	60.00-61.00

Stainless Steel Scrap

18-8 bundles & solids	165.00-175.00
18-8 turnings	85.00-90.00
430 bundles & solids	100.00-110.00
430 turnings	50.00-55.00

CHICAGO

No. 1 heavy melt., indus.	*31.00-32.00*
No. 1 hvy melt., dealer	*29.00-30.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 factory bundles	*34.00-35.00*
No. 1 dealer bundles	*31.00-32.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling, indus.	*31.00-32.00*
No. 1 busheling, dealer	*29.00-30.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*19.00-20.00*
Cut structurals, 3 ft	*41.00-42.00*
Punchings & plate scrap	*42.00-43.00*

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	38.00-39.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	48.00-49.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00-35.00*
R.R. malleable	53.00-54.00
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Angles, splice bars	51.00-52.00
Axles	56.00-57.00
Rails, rerolling	54.00-55.00

Stainless Steel Scrap

18-8 bundles & solids	160.00-165.00
18-8 turnings	85.00-95.00
430 bundles & solids	90.00-100.00
430 turnngs	47.50-52.50

YOUNGSTOWN

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 busheling	*34.00-35.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	24.00-25.00
Machine shop turnings	*10.00-11.00*
Short shovel turnings	*14.00-15.00*
Cast iron borings	*14.00-15.00*
Low phos.	*36.00-37.00*
Electric furnace bundles	*36.00-37.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*

CLEVELAND

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	21.00-22.00
No. 1 factory bundles	*33.00-34.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*31.00-32.00*
Machine shop turnings	*8.00-9.00*
Short shovel turnings	*12.00-13.00*
Mixed borings, turnings	*12.00-13.00*
Cast iron borings	*12.00-13.00*
Cut foundry steel	*36.00-37.00*
Cut structurals, plates 2 ft and under	*41.00-42.00*
Low phos. punchings & plate	*32.00-33.00*
Alloy free, short shovel turnings	*17.00-18.00*
Electric furnace bundles	*32.00-33.00*

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Charging box cast	*34.00-35.00*
Heavy breakable cast	*34.00-35.00*
Stove plate	43.00-44.00
Unstripped motor blocks	26.00-27.00
Brake shoes	34.00-35.00
Clean auto cast	*43.00-44.00*
Burnt cast	*31.00-32.00*
Drop broken machinery	48.00-49.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	50.00-51.00
Cast steel	47.00-48.00
Railroad specialties	*49.00-50.00*
Uncut tires	41.00-42.00
Angles, splice bars	*49.00-50.00*
Rails, rerolling	56.00-57.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	30.00
No. 1 bundles	33.00
No. 2 bundles	25.00
No. 1 busheling	33.00
Machine shop turnings	18.00
Short shovel turnings	20.00

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Clean auto cast	45.00
Stove plate	*40.00*

Railroad Scrap

No. 1 R.R. heavy melt.	38.00
Rails, 18 in. and under	56.00
Rails, random lengths	50.00
Rails, rerolling	56.00
Angles, splice bars	49.00

BIRMINGHAM

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.00-34.00
No. 2 bundles	*21.00-22.00*
No. 1 busheling	33.00-34.00
Cast iron borings	12.00-13.00
Machine shop turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Bar crops and plates	*39.00-40.00*
Structurals & plates	38.00-39.00
Electric furnace bundles	37.00-38.00
Electric furnace:	
2 ft and under	37.00-38.00
3 ft and under	36.00-37.00

Cast Iron Grades

No. 1 cupola	51.00-52.00
Stove plate	49.00-50.00
Unstripped motor blocks	40.00-41.00
Charging box cast	22.00-23.00
No. 1 wheels	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	49.00-50.00
Rails, rerolling	52.00-53.00
Rails, random lengths	45.00-46.00
Angles, splice bars	43.00-44.00

PHILADELPHIA

No. 1 heavy melting	38.50
No. 2 heavy melting	35.00
No. 1 bundles	38.50
No. 2 bundles	28.00
No. 1 busheling	38.50
Electric furnace bundles	40.00
Mixed borings, turnings	18.50†
Short shovel turnings	21.00†
Machine shop turnings	18.50†
Heavy turnings	34.00†
Structurals & plate	43.00-44.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	59.00-60.00

Cast Iron Grades

No. 1 cupola	40.00
Heavy breakable cast	44.00
Malleable	62.00
Drop broken machinery	50.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.00-34.00
No. 2 bundles	22.00-23.00
Machine shop turnings	11.00-12.00†
Mixed borings, turnings	12.00-13.00†
Short shovel turnings	14.00-15.00†
Low phos. (structurals & plates	Nominal

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	*28.00-29.00*
Heavy breakable	*34.00-35.00*

Stainless Steel

18-8 sheets, clips, solids	155.00-160.00
18-8 borings, turnings	*60.00-65.00*
410 sheets, clips, solids	60.00-65.00
430 sheets, clips, solids	75.00-80.00

†Nominal

BUFFALO

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Mixed borings, turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Short shovel turnings	15.00-16.00
Cast iron borings	14.00-15.00
Low phos. structurals and plate, 5 ft and under	33.00-34.00
2 ft and under	37.00-38.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*43.00-44.00*
No. 1 machinery	*48.00-49.00*

Railroad Scrap

Rails, random lengths	47.00-48.00
Rails, 3 ft and under	53.00-54.00
Railroad specialties	37.00-38.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.50-29.50
No. 1 bundles	32.00-33.00
No. 2 bundles	*23.00-24.00*
No. 1 busheling	32.00-33.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings	19.00-20.00
Cast iron borings	15.00-16.00
Low phos. 18 in.	40.00-41.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast	33.00-34.00
Charging box cast	33.00-34.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	54.00-55.00
Rails, random lengths	44.00-45.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	37.00*
No. 2 heavy melting	34.00*
No. 2 bundles	26.00*
Crushed turnings	23.00*
Machine shop turnings	19.50-20.00*
Low phos. plates, structurals	40.00-41.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Heavy breakable	30.00-31.00*
Unstripped motor blocks	30.00-32.00*

Railroad Scrap

No. 1 R.R. heavy melt.	37.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	30.00
No. 2 heavy melting	22.00
No. 1 bundles	29.00
No. 2 bundles	17.00
No. 1 busheling	29.00
Machine shop turnings	9.50-10.00†
Mixed borings, turnings	9.50-10.00
Short shovel turnings	11.00-11.50†
No. 1 cast	29.00-30.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

†Nominal.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	*16.00-17.00*
No. 1 busheling	*26.00-27.00*
Machine shop turnings	*7.00-8.00*
Mixed borings, turnings	*9.00-10.00*
Short shovel turnings	*10.00-11.00*
Punchings & plate	29.00-30.00

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Stove plate	*30.00-31.00*
Charging box cast	*28.00-29.00*
Heavy breakable	*30.00-31.00*
Unstripped motor blocks	*20.00-21.00*
Clean auto cast	*37.00-38.00*

SEATTLE

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	24.00
No. 2 bundles	23.00
Machine shop turning	16.00
Mixed borings, turnings	16.00
Electric furnace No. 1.	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast.	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	28.00
No. 2 bundles	20.00
Machine shop turnings	9.00
Shoveling turnings	11.00
Cast iron borings	10.00
Cut structurals and plate 1 ft and under	43.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	38.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	32.00
No. 2 heavy melting	28.00
No. 1 bundles	32.00
No. 2 bundles	25.00
Mixed steel scrap	27.00
Mixed borings, turnings	17.00
Busheling, new factory:	
Prepared	32.00
Unprepared	26.00
Short steel turnings	21.00

Cast Iron Grades†

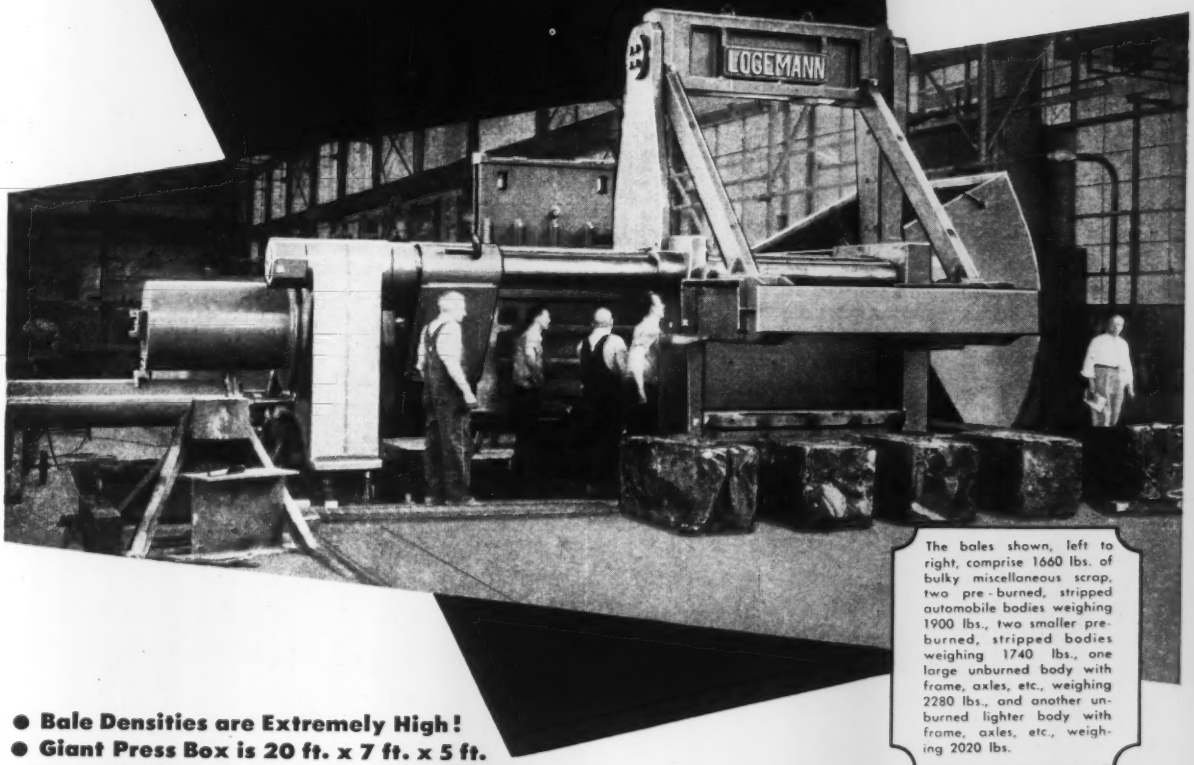
No. 1 machinery cast	45.00-50.00

†F.o.b. Hamilton, Ont.

LOGEMANN *presents*

the new giant triple-compression 4000-P Series of

SCRAP PRESSES



The bales shown, left to right, comprise 1660 lbs. of bulky miscellaneous scrap, two pre-burned, stripped automobile bodies weighing 1900 lbs., two smaller pre-burned, stripped bodies weighing 1740 lbs., one large unburned body with frame, axles, etc., weighing 2280 lbs., and another unburned lighter body with frame, axles, etc., weighing 2020 lbs.

- **Bale Densities are Extremely High!**
- **Giant Press Box is 20 ft. x 7 ft. x 5 ft.**
- **Two 150 HP Pumps Generate Hydraulic Pressure**

In this Logemann Scrap Press compressed bales measure 24 inches by 24 inches by a variable third dimension which is determined by the character and quantity of scrap charged. The first or gathering ram compresses the load of scrap from 20 ft. to 2 ft. . . . the intermediate side ram reduces the cross-dimension from 7 ft to 2 ft. . . . finally the third or finishing ram moves upward, to compress the vertical dimension into an extremely dense bale, ready for remelting. The cover is then withdrawn and the finishing ram elevates the compressed bale level with the top of the box, to allow the cover to push it off for loading into cars.

Two large 150 HP pumps generate hydraulic pressure for operating the press-rams at high pressures. Three smaller pumps are used to operate the press cover and the loading hopper. This hopper can be filled with miscellaneous scrap while the press is making a bale, and then dumped quickly into the box as soon as the preceding bale has been discharged.

The large pumps give rapid movement to all rams, and to handle their fluid delivery the operating-valves are proportionately over-size. These valves are operated by compressed air and easily controlled from a remote stand, through a bank of electrical switches and push-buttons, in front of the operator.

This same press can be used for baling bodies and extremely bulky scrap, also for making standard size, high-density bales of new sheet clips.

We are prepared to build many smaller sizes or larger, if required, to meet your specific requirements. You are invited to present your problem for discussion.

Write for details about the newly developed 3500-P series with tamping cover and side bale ejection and the new giant double compression press with box 20 ft. long, 7½ ft. wide, and 5 ft. deep.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Revival in Copper?

Price rises at home and abroad may spark an upturn for the red metal. Government unhappy with premium nickel contracts. More aluminum expansion coming

Nonferrous Metal Prices, Pages 142 & 143

A MILD upturn for copper may be just around the corner.

The most encouraging sign is the worldwide firming of prices, a complete reversal of conditions.

In latest price developments: 1. Custom smelters put through two 0.5 cent a pound price rises within a week, boosting their quotation to 24 cents. This was the first upward move since Dec. 16. 2. Katanga has advanced its price to 22.45 cents a pound, c.i.f. New York. 3. The London Metal Exchange price has moved up sharply from a low of around 20 cents a pound to close to 22.5 cents (as of Mar. 25).

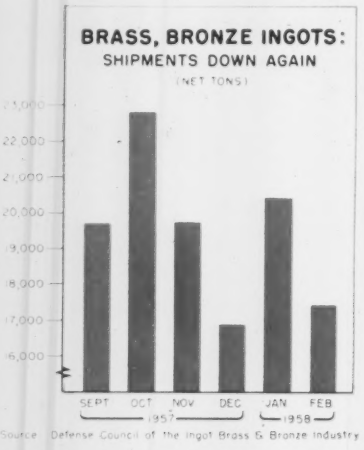
Why—The responsibility for copper's comeback can't be pegged to a single factor. Of major importance in London's climb is the strong demand for the metal in Europe. There's now a shortage in certain areas.

European demand, with the resultant strengthening in LME prices, has reduced the quantity of low priced copper coming into the U. S. Buyers who had been getting this cheaper metal from dealers suddenly turned to custom smelters. The upsurge in demand pulled up prices. Other plus factors: A strengthening of copper on the stock market, more spectacular activity on the Commodity Exchange, and a shortage of copper-base scrap on the open market.

Best in a Year—Custom smelters are encouraged by a pickup in demand from wire and brass mills. One company reports the sales upturn is greater than any in the last year. Two unknowns: How much of this buying is for inventory? How much is to satisfy current demand?

Tariff—If the copper price holds up, it will weaken chances for additional tariff legislation (see STEEL, Jan. 27, p. 128). Rep. Stewart L. Udall (D., Ariz.) and Rep. Lee Metcalf (D., Mont.) recently appealed to the House Ways & Means Committee to approve their bill which calls for a 4-cent-a-pound tariff whenever the price falls below 30 cents.

A source close to Representative



Source: Defense Council of the Ingot Brass & Bronze Industry

Udall told STEEL the bill appears to have little chance. Congressional support appears limited to mine state legislators and those from the brass mill sections of New England.

More Aluminum

Aluminium Ltd. plans to spend $125 million on expansion this year, says Nathanael V. Davis, president. Principal facilities under construction: 1. An alumina plant in Jamaica and one in British Guiana. 2. A bauxite mine in French West Africa. 3. A new power development on Canada's Peribonka River which will add about 1 million hp to hydroelectric capacity. By the end of 1959, says Mr. Davis, Aluminium's power capacity in Canada will be over 4.5 million hp, enough to support a primary aluminum capacity of 1 million tons yearly. (Present capacity is 770,000 tons.)

Nickel: Contract Fuss

It's becoming more evident that the government isn't exactly happy with Korean War contracts that obligate it to buy substantial tonnages of nickel at premium prices. Franklin G. Floete, General Services Administration boss, recently told a House subcommittee he was negotiating for cancellation of some of the contracts. Premium contracts are held by International Nickel Co., Falconbridge Nickel Mines Ltd., and M. A. Hanna Co. National Lead Co., Sheritt Gordon Mines Ltd., and Freeport Sulphur Co. have market price contracts.

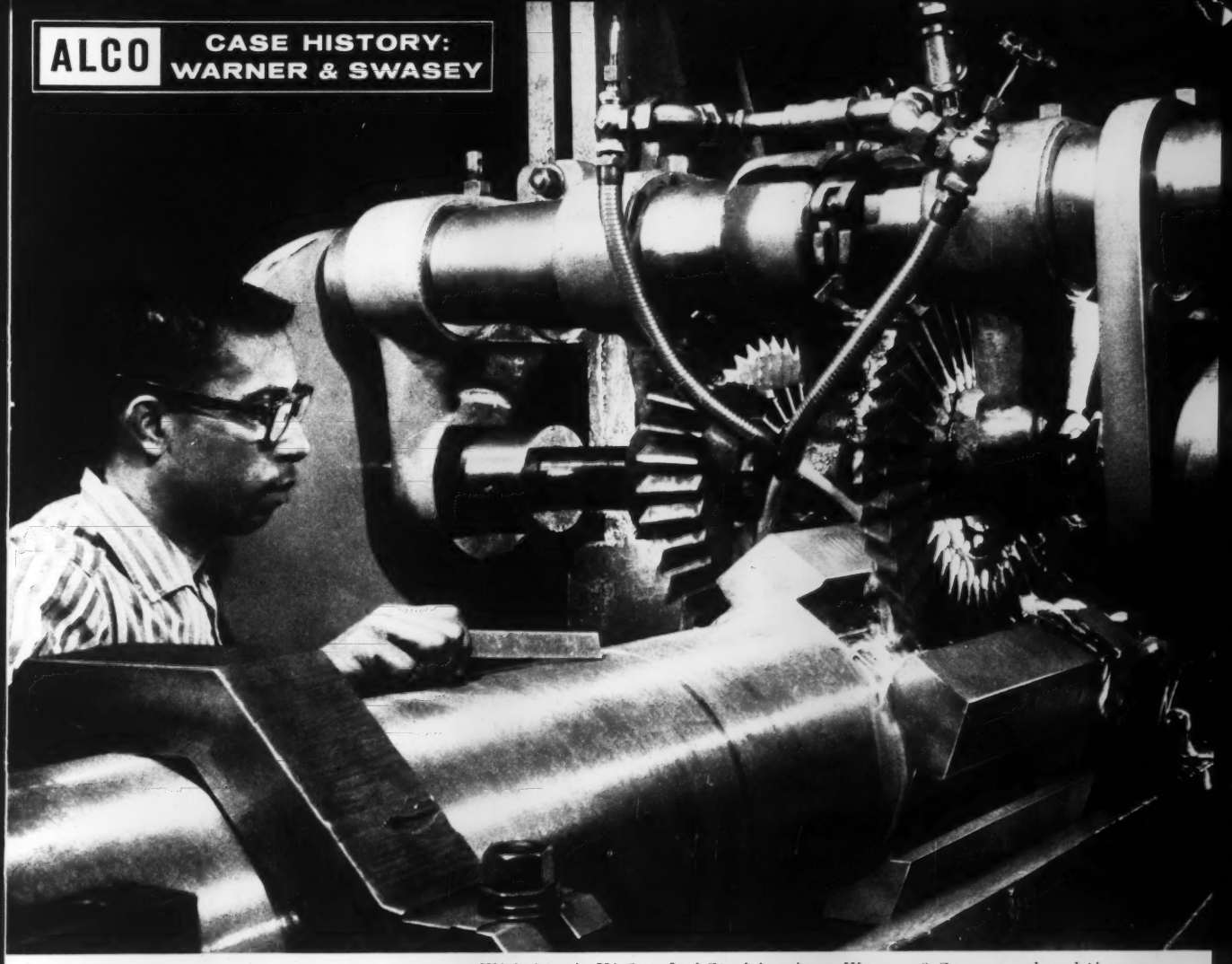
Inco has agreed to suspend shipments of premium nickel to the Defense Production Act inventory (1500 tons monthly) during the first nine months of 1958. Evidently, GSA hopes demand will pick up sufficiently so Inco can sell some of the metal on the open market.

It's unlikely nickel companies will be receptive to contract renegotiations. The slump in demand makes it difficult to move the market grade, let alone the premium.

NONFERROUS PRICE RECORD

	Mar. 26 Price	Last Change	Previous Price	Feb. Avg	Jan. Avg	Mar., 1957 Avg
Aluminum	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	24.00-25.00	Mar. 24, 1958	23.00-25.00	24.298	25.135	31.462
Lead	12.80	Dec. 2, 1957	13.30	12.800	12.800	15.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	93.50	Mar. 26, 1958	93.625	93.818	92.933	99.683
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



With ALCO's *Hi-Qua-Led Steel forgings, Warner & Swasey reduced time for straddle-mill dovetailing of tool holder's pentagon shape by 71%.*

MACHINE TIME CUT 33%, TOOL LIFE TRIPLED WITH ALCO'S HI-QUA-LED® STEEL FORGINGS

With open-die forgings of ALCO's special free-machining Hi-Qua-Led Steel, Warner & Swasey has reduced machining time 33% on a pentagon-bar tool holder for their automatic chucking machine. Time for the various milling operations has been reduced as much as 71%, and turning time 33%.

Warner & Swasey has found that in every operation the use of Hi-Qua-Led forgings has meant savings in tool life, machining time or both. In the trepanning operation, run at the same speed as before, the life of expensive tools has increased up to three times.

ALCO's Hi-Qua-Led Steel forgings have unique advantages of machinability, while maintaining the physical characteristics of regular forgings of the same grade. Cost is just a few cents more. Circular shapes, forged and rolled, range from 18 to 145 in. OD; open-die shapes from 1000 to 30,000 lbs and up to 40 ft long; mandrelled ring forgings up to 60 in. wide.

Contact your nearest ALCO sales office for full information on the many advantages of Hi-Qua-Led Steel forgings, or write ALCO Products, Department 154, Schenectady, New York.

ALCO

ALCO PRODUCTS, INC.

NEW YORK

SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES • DIESEL ENGINES • NUCLEAR REACTORS • SPRINGS • STEEL PIPE • FORGINGS • OIL FIELD EQUIPMENT

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-90 per lb, nom.

Copper: Electrolytic, 25.00 deld.; custom smelters, 24.00; lake, 25.00 deld.; fire refined, 24.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-90 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $232-237 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $68-75 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 88.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 93.50.

Titanium: Sponge, 99.3+ %, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+ % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.00-25.50; No. 12 foundry alloy (No. 2 grade), 21.00-21.50; 5% silicon alloy, 0.60 Cu max., 25.00-25.25; 13 alloy, 0.60 Cu max., 25.00-25.25; 195 alloy, 24.00-26.00; 108 alloy, 21.50-21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.00; grade 2, 21.25; grade 3, 20.00; grade 4, 18.00.

Brass Ingot: Red brass, No. 115, 25.25; tin bronze, No. 225, 34.00; No. 245, 28.75; high-leaded tin bronze, No. 305, 29.25, No. 1 yellow, No. 405, 20.75; manganese bronze, No. 421, 23.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53; l.c.l., 33.28. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; plate, $12.50-19.20; H.R. strip, $12.50-22.90; $11.00-17.40.

ZIRCONIUM

C.R. strip, $15.00-31.25; forged or H.R. bars, ribbon zinc in coils, 20.50; plates, 19.00.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	44.40	51.20
6061-T6	46.90	53.00
2024-T4	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, random lengths: 2014-F, 46.90-53.90, diam. 1-8 in.; 6061-F, 43.50-53.90, diam. 1-6 in.; 7075-F, 63.50-73.90, diam. 1-3.875 in.; 7079-F, 68.50-78.90, diam. 1-3.875 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 10.00-10.50; borings and turnings, 6.50-

BRASS MILL PRICES

MILL PRODUCTS a — SCRAP ALLOWANCES f

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13b	45.36c	....	48.32	21.000	21.000	20.250
Yellow Brass	42.69	31.03d	43.23	45.60	16.125	15.875	14.500
Low Brass, 80%	44.90	44.84	45.44	47.71	17.875	17.625	17.125
Red Brass, 85%	45.67	45.61	46.21	48.48	18.625	18.375	17.875
Com. Bronze, 90%	46.98	46.92	47.52	49.54	19.250	19.000	18.500
Manganese Bronze	50.81	44.91	55.44	....	14.875	14.625	14.125
Muntz Metal	45.19	41.00	....	....	15.125	14.875	14.375
Naval Brass	47.07	41.38	54.13	50.48	14.875	14.625	14.125
Silicon Bronze	52.84	52.03	52.88	54.77	20.625	20.375	19.625
Nickel Silver, 10%	57.93	60.26	60.26	....	21.125	20.875	10.562
Phos. Bronze, A-5%	67.17	67.67	67.67	68.85	21.875	21.625	20.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcase, 10.00-10.50; industrial castings, 10.00-10.50.

Copper and Brass: No. 1 heavy copper and wire, 17.50-18.00; No. 2 heavy copper and wire, 15.50-16.00; light copper, 13.50-14.00; No. 1 composition red brass, 14.50-15.00; No. 1 composition turnings, 13.50-14.00; new brass clippings, 13.00-13.50; light brass, 8.50-9.00, heavy yellow brass, 10.00-10.50; new brass rod ends, 11.00-11.50; auto radiators, unsweated, 11.00-11.50; cocks and faucets, 12.00-12.50; brass pipe, 12.00-12.50.

Lead: Heavy, 8.50-9.00; battery plates, 3.50-3.75; linotype and stereotype, 10.50-11.00; electrotype, 9.50-10.00; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.25-16.50;; 3003 clippings, 16.25-16.50; 6151 clippings, 15.75-16.50; 5052 clippings, 15.75-16.00; 2014 clippings, 15.25-16.00; 2017 clippings, 15.25-16.00; 2024 clippings, 15.25-16.00; mixed clippings, 14.75-15.00; old sheets, 12.25-12.50; old cast, 12.25-12.50; clean old cable (free of steel), 15.25-15.50; borings and turnings, 13.00-14.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire, 18.25; light copper, 16.00; refinery brass (60% copper) per dry copper content, 17.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire, 18.25; light copper, 16.00; No. 1 composition borings, 17.25; No. 1 composition solids 17.25; heavy yellow brass solids, 11.50; yellow brass turnings, 10.50; radiators, 13.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 41.79; oval, 40.00, 5000-10,000 lb; electrodeposited, 31.25, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 112.50; 200-499 lb, 111.00; 500-999 lb, 110.50; 1000 lb or more, 110.00.

Zinc: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.
Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 68.40; 300-900 lb, 66.40; 1000-19,900 lb, 64.40.
Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-9999 lb, 43.50; 10,000 lb or more, 40.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 75.20; 100-600 lb, 66.20; 700-1900 lb, 63.50; 2000-9900 lb, 61.60; 10,000 lb or more, 60.30.

Stannous Chloride (anhydrous): Less than 25 lb, 164.70; 25 lb, 129.70; 100 lb, 114.70; 400 lb, 112.20; 5200-19,600 lb, 100.00; 20,000 lb or more, 87.80.

Stannous Sulphate: Less than 50 lb, 127.50; 50 lb, 97.50; 100-1900 lb, 95.50; 2000 lb or more, 93.50.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(Concluded from Page 137)

to move at higher prices. Heavy melting steel from the L. & N. brought $39, delivered, but sales by the other two roads were at $37.50. Brokers expected higher prices would be developed.

Houston—April mill support for the local scrap industry will be only token in nature unless a sharp upturn in steel demand develops. Brokers are expecting prices to decline $3 to $5 a ton under March quotations. Both Texas steel mills hold heavy scrap inventories.

A Mexican mill, buying trucked scrap through Eagle Pass, Tex., provided the only southwest market for scrap south of Kansas City during the latter part of March. Mill buyers cut prices $8 during a three-day period, resulting in an over-the-scale Eagle Pass price to truckers of $29, net, for No. 1 heavy melting.

Two scrap cargoes are scheduled for loading in gulf ports during April. Tonnages have been accumulated.

Birmingham—Most consumers in this area are out of the market at present. Dealers say they have filled all orders on hand and are pressing for new business at the price levels that have been prevailing in recent weeks. Brokers look for a quiet April. Some of them are predicting lower prices, particularly on cast iron items, supplies of which are coming into dealers' yards in rising volume.

San Francisco — Some improvement in steel mill operations in this area has given rise to the hope that the scrap market may shortly develop a sympathetic reaction. Little steel scrap is moving at present. The mills are well stocked and no early resumption of buying is seen.

Los Angeles—Dealers here anticipate little improvement in the market until mid-May. Seasonal factors then are expected to strengthen the market undertone. Mill buying remains at a virtual standstill.

Seattle — Scrap prices are unchanged here. The larger buyers are out of the market. They hold sizable inventories. Still, yard receipts are limited; shippers apparently are holding back, expecting higher prices to develop later. There is insufficient turnover to establish firm price levels at present, so current quotations are nominal. Little interest is noted in the export market.

Tool Steel . . .

Tool Steel Prices, Page 131

Automotive demand for steel to be used in dies for the 1959 models is increasing, several producers report. One Pittsburgh supplier with warehouses in Michigan, says sales from two distributing points in the Detroit area increased in first quarter. Demand in that area is as strong as it was last October, suppliers report.

In other consuming areas, tool steel demand remains slow. Competition for each sale continues keen. Complaints are heard of individual firms' waiving extras to make a sale, but no evidence of a basic weakness in the price structure is noted.

Stainless Steel . . .

McLouth Steel Corp., Detroit, is not buying any scrap for April intake. The company's production is drastically reduced because orders for stainless steel are down.

The Stainless Div., Jones & Laughlin Steel Corp., Detroit, is also feeling the lack of strong demand. It's operating on a week on, week off schedule.

CRANE
1 SHAW BOX 15 Ton 100' Span
1 P & H 15 Ton 100' Span
1000' Runway A-Frame Mounted
25' Clearance
230 DC Volts. Photographs Available.
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MACHINE TOOL SALESMEN WANTED
Country-wide opportunity to represent leading machinery firm in sale of extensive line of new equipment and/or used. Only apply if you have top sales record. Send all details first letter. Correspondence confidential. Write: L. D. Srybnik, **S & S Machinery Company**, 140 - 53rd Street, Brooklyn 32, New York.

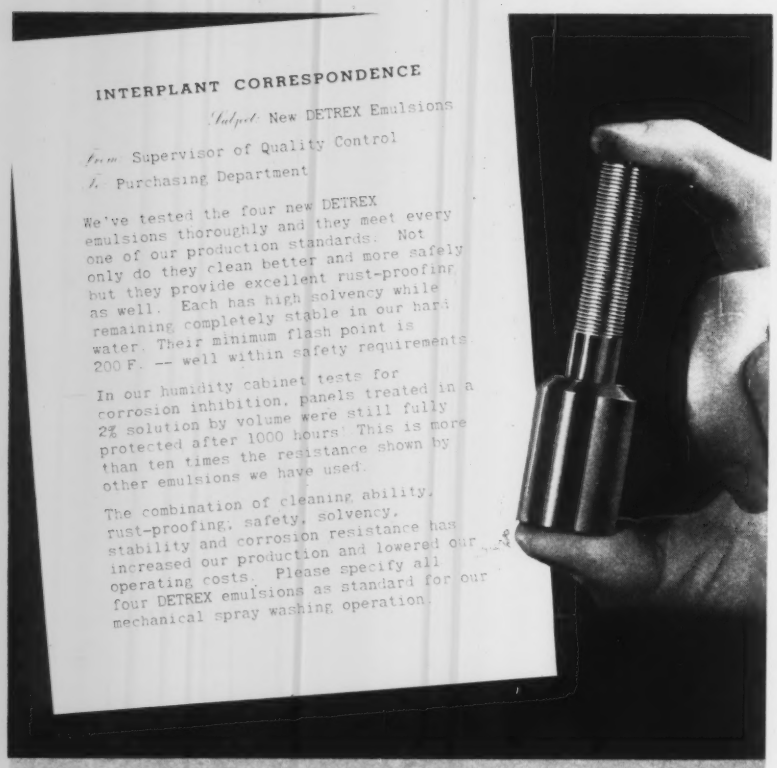
CLASSIFIED

Help Wanted

GENERAL FOUNDRY FOREMAN
For mechanized ferrous foundry in Midwest. Must be experienced in gating. Have knowledge of Standard Costs. Supervise all molding operations. Submit confidential resume. Write Box 646, STEEL, Penton Bldg., Cleveland 13, Ohio.

EXPERIENCED MISCELLANEOUS AND ORNAMENTAL iron estimator or detailer to take complete charge of drafting department, including all purchasing and expediting. Please give complete resume of experience, age, and salary expected in first reply. Write Box 648, STEEL, Penton Bldg., Cleveland 13, Ohio.

MEMO TO MANAGEMENT


INTERPLANT CORRESPONDENCE
Subject: New DETREX Emulsions
From: Supervisor of Quality Control
To: Purchasing Department
We've tested the four new DETREX emulsions thoroughly and they meet every one of our production standards. Not only do they clean better and more safely but they provide excellent rust-proofing as well. Each has high solvency while remaining completely stable in our hard water. Their minimum flash point is 200 F. -- well within safety requirements.
In our humidity cabinet tests for corrosion inhibition, panels treated in a 2% solution by volume were still fully protected after 1000 hours! This is more than ten times the resistance shown by other emulsions we have used.
The combination of cleaning ability, rust-proofing, safety, solvency, stability and corrosion resistance has increased our production and lowered our operating costs. Please specify all four DETREX emulsions as standard for our mechanical spray washing operation.

New cleaning power, rust-proofing and economy for mechanical spray washing operations

This group of four new DETREX emulsions has been proven in extensive on-the-job tests. Because they go into solution when agitated they are ideal for mechanical spray washing operations.

Throughout the metal cleaning processing field DETREX is noted for the perfection of many such advancements. This reputation for continued progress can bring substantial savings to your operation. DETREX service continues beyond the initial sale with regular checks on product performance and efficiency. Only DETREX provides such complete coverage—from recommendation of the proper method through installation to periodic counsel and service. Write today for full information on DETREX men, methods, materials and machines for greater production and profit.

DETREX CHEMICAL INDUSTRIES, INC.

BOX 501, DEPT A-1201 DETROIT 32, MICH

(*Concluded from Page 124*)

380 tons, library, Harpur College, Endicott, N. Y.; Foster-Newman Construction Co. is the general contractor; 515 tons of other construction for this college has been let to the Bethlehem Contracting Co., Bethlehem, Pa.

345 tons, two state bridges, Cumberland-Yarmouth, Maine; H. E. Callahan Inc., Auburn, Maine, general contract; also 180 tons, reinforcing bars, and 100 tons of H-beam piles.

350 tons, two I-beam bridges, Bangor, Maine; Westcott Construction Corp., North Attleboro, Mass., general contract; also 685 tons, reinforcing bars, and 55 tons of H-beam piling.

170 tons, junior and senior high school, Palmyra, Pa.; bids closed.

150 tons, Blue Cross headquarters, Seattle; John H. Sellen Construction Co., Seattle, low at $695,890.

150 tons, telephone building, Billings, Mont.; Lamont & Fey, Seattle, designers; bids soon.

125 tons, state bridge work, Essex County, New Jersey, bids Apr. 15; 161 tons of reinforcing steel also required.

Unstated, University District bridge, Seattle freeway; bids soon.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3010 tons, third phase, Seattle viaduct, Washington State, to the Bethlehem Pacific Coast Steel Corp., Seattle; Rumsey & Co. and Morrison-Knudsen Inc., Seattle, general contractors.

1500 tons, newspaper publishing plant, *Herald-Traveler*, Boston, to the U. S. Steel Supply Div., U. S. Steel Corp., Boston; R. Perini & Sons Inc., Framingham, Mass., is general contractor.

875 tons, law school, University of Chicago, Chicago, to the Bethlehem Steel Co., Bethlehem, Pa.; S. N. Nielson Co., Chicago, general contractor; fabricated structural steel to Wendnagel & Co. Inc., Chicago.

400 tons, high school, West Lawn, Pa., to the American Steel Engineering Co., Philadelphia; Potteiger Co. Inc., West Reading, Pa., is general contractor.

400 tons, state highway bridges, Lycoming County, Pennsylvania, to Taylor-Davis Inc., Philadelphia; J. Richard Nissley Inc., Landisville, Pa., is general contractor.

315 tons, state hospital building, Westboro, Mass., to the Scherer Steel Co., Hartford, Conn.; Joseph Rugo Co., Boston, is general contractor.

300 tons, basic science building, Johns Hopkins University, Baltimore, to the Bethlehem Steel Co., Bethlehem, Pa.; Consolidated Engineering Inc., Baltimore, is general contractor.

150 tons, Skagit River bridge, Washington State, to the Northwest Steel Rolling Mills Inc., Seattle; Manson Construction & Engineering Co., Seattle, general contractor.

140 tons, highway bridge, Washington State, to the J. D. English Steel Co., Tacoma; J. E. Alexander Co., Seattle, general contractor.

100 tons, White Center Boys' Club, and miscellaneous, to the Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons plus, railroad underpass, Oregon, Wasco County, to unstated interest; general award to Babler Bros., Portland, Oreg., at $161,626.

100 tons, additional wing, St. Mary's Hospital, Huntington, W. Va., to the H. K. Porter Company Inc., New York; Frank Messer & Sons Inc., Cincinnati, is general contractor.

REINFORCING BARS PENDING

865 tons, North Hartland, Vt., dam and appurtenant structures; bids about May 1, to the U. S. Engineer, Springfield, Mass.

400 tons, University of Washington, mechanical engineering building, Seattle; John H. Sellen Construction Co., Seattle, is low at $869,975.

270 tons, including wire fabric, reinforcing concrete bridge and approaches, Six Corners underpass, East Providence, R. I.

210 tons, dam and appurtenant structures, Cambria County, Pennsylvania; bids Apr. 10, Harrisburg, Pa.

161 tons, state bridge work, Essex County, New Jersey, bids Apr. 15.

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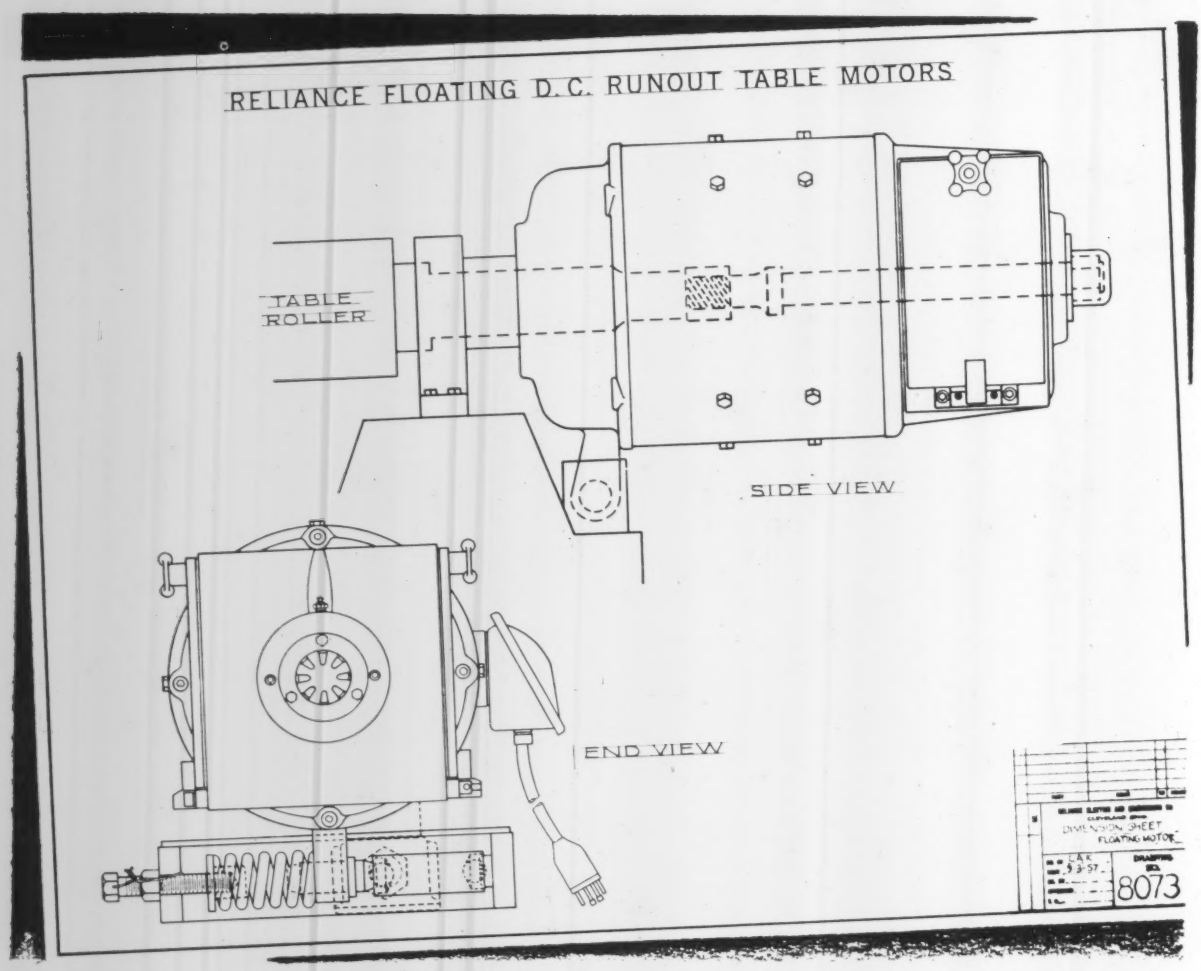


Reliance runout table motors cut installation and maintenance costs

Reliance Hollow Shaft, floating motors are easy to install. They require no special pedestals or flexible couplings.

The hollow shaft motors fit right over the table-roller shaft. No special alignment is required. Warpage and backlash compensation are handled by the heavy tie-down spring. Not only are coupling maintenance and lubrication eliminated, but a much greater degree of roller misalignment can be tolerated.

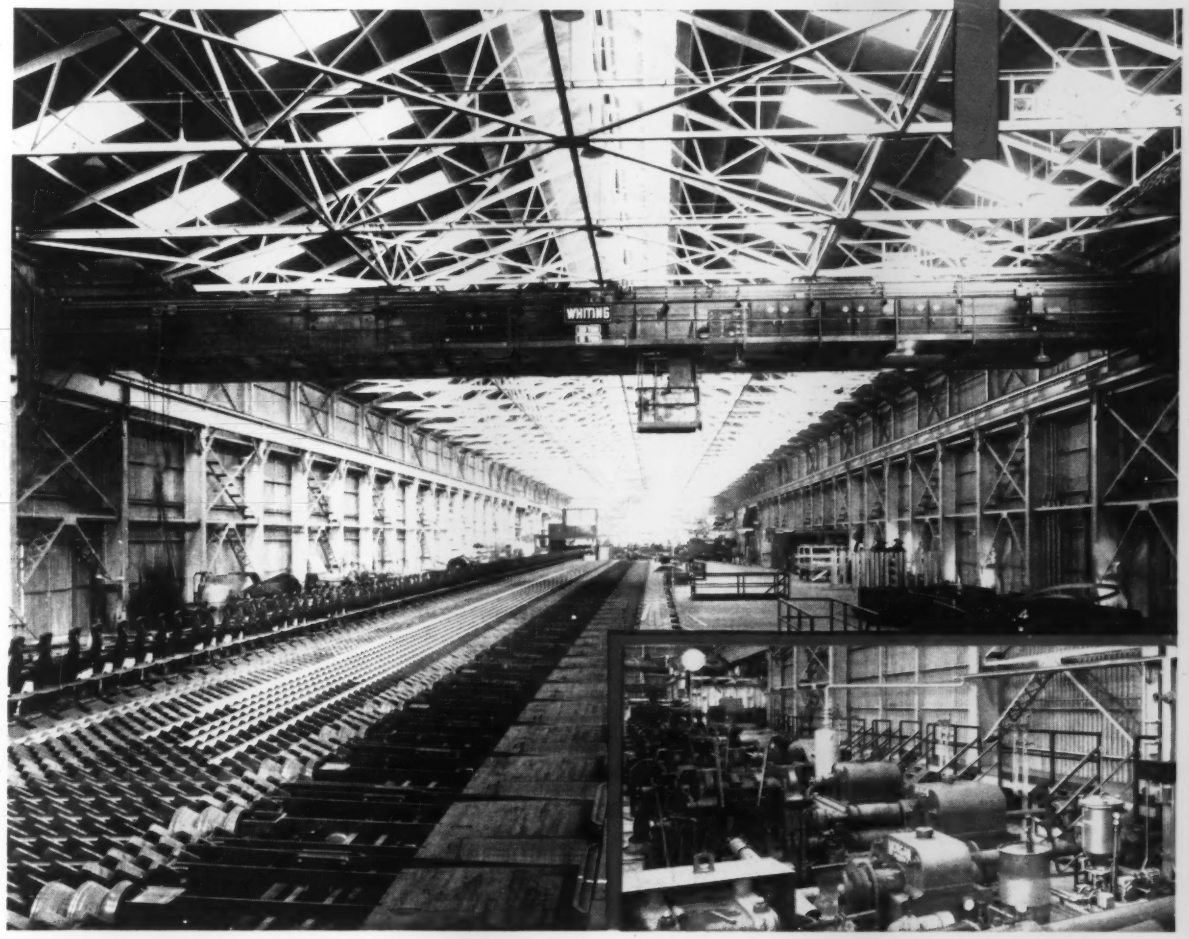
Reliance Floating motors are designed and built specifically for runout table service. They are available with a wide range of speeds and out-put torques. For complete information contact your local Reliance Representative, or write for Bulletin No. F-2051. C-1587

RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 114A, CLEVELAND 17, OHIO
CANADIAN DIVISION: TORONTO, ONTARIO
Sales Offices and Distributors in principal cities

Farval serves 1133 mill and crane bearings in Atlantic Steel's new bar and rod mill

FARVAL—
Studies in Centralized Lubrication
No. 205



KEYS TO ADEQUATE LUBRICATION—
Inset above shows Farval automatic pumping station No. 3, serving 240 points on 15 horizontal mills, edging mill, furnace switch and pullout, all designed and manufactured by Morgan Construction Company. Above you see *Farvalized* overhead crane and runout tables in the Atlantic Steel Co. mill room.

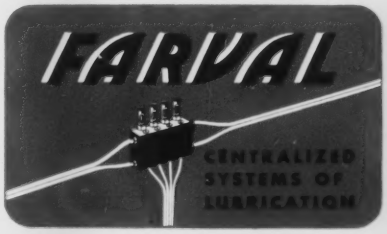
•Last word for modern machines and manufacturing practice, this Atlanta steel company also employs the most modern method of lubrication—Farval Centralized Lubrication. Twenty-four Farval systems keep mills and cranes running smoothly, serving a total of 1133 bearings.

You'll generally find Farval in evidence wherever steel is made or worked. Literally thousands of systems, automatic and manually operated, protect millions of bearings in the metals industries—some of them still efficiently on the job after 25 to 30 years of service.

Farval is the original Dualine system of centralized lubrication that delivers measured amounts of oil or grease under pressure to every bearing as often as desired. No bearing is ever missed.

Write for newly revised Bulletin 26-S, which tells the whole Farval story. The Farval Corporation, 3270 E. 80th St., Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing.
In Canada: Peacock Brothers Limited.



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COLD MILLS

Mesta 56" Four-High, Four-Stand Tandem Cold Mill
Installed at the Brackenridge Plant of Allegheny-Ludlum Steel Corp.

Designed and Built by MESTA

FOR THE COLD REDUCTION OF STAINLESS, SILICON, HIGH-ALLOY AND CARBON STEELS

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